1954

Monograph of the Cydnidae of the Western Hemisphere

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NOTE TO USERS

MONOGRAPH OF THE CYDNIDAE OF THE WESTERN HEMISPHERE

by

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A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subject: Entomology

Approved:

Signature was redacted for privacy.

In Charge of Major Work

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Signature was redacted for privacy.

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Iowa State College
1954

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INTRODUCTION

The group of hemipterous insects treated here as a full family, the Cydnidae, exhibits definite pentatomoid affinities, even though a few of the genera possess only four segments in their antennae. This relationship has long been recognized and acknowledged, but the features separating the cydnids from the other pentatomoids have been accorded varying importance by different authors. Some workers contend that the pentatomoids comprise a single family with many subfamilies, thus according the cydnids subfamily rank under the Pentatomidae; others express the belief that the present group and the corimelaenid bugs deserve to be united into a single family, the Cydnidae or Corimelaenidae according to the authority accepted; while still others contend that even this arrangement is unsatisfactory and that each of these two groups are properly given full family status.

A clear-cut definition of the Cydnidae in the restricted sense, as now generally accepted and used here, is not easy to formulate. McAtee and Malloch (1933:194) listed several features which they considered to set the cydnid and corimelaenid bugs apart from the other Pentatomoidae, as follows[1]:

> . . . the presence of fringes of closely set, stiff, bristles at the apices of the mid and hind coxae and the spiracles of the second abdominal segment being in a membranous strip of the sternite, not in the heavily sclerotized portion. Members of these two subfamilies have tri-segmented tarsi, and distinct tibial bristles, and, with the exception of the Sehirini, have the trichobothria longitudinally arranged often nearly in line

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[1]The parenthetic references to illustrations in the original have been omitted from this quotation.

> with the spiracles. The trichobothria, or delicate, pale, sensory hairs (which must not be confused with the strong, dark, lateral bristles which are frequently present) are two in number on each side of all sternites and in the other subfamilies of the Pentatomidae are arranged transversely, or nearly so, behind the spiracles.

Disregarding the corimelaenids which McAtee and Malloch (loc. cit.) adequately separated from the cydnids on the basis of the greater claval exposure and the absence of "an area of smooth chitin behind the eyes on the ventral surface of the head," the results of the present study agree with most of those statements. They confirm McAtee and Malloch's observations in the presence of the apical fringe of bristles on the middle and hind coxae, the presence of the distinct tibial bristles, the three segmented tarsi (except in Scaptocoris where the hind legs lack tarsi) and the location of the spiracle of the second abdominal segment. In contrast, the present results show that the description of the trichobothrial arrangement is not true for all genera in the Cydnidae. McAtee and Malloch apparently followed Tullgren (1918) concerning the location of these structures in Cydnidae. Tullgren's choice of two genera for study was unfortunate because both of them (Sehirus and Gnathoconus) were members of the subfamily Sehirinae which agrees with the other pentatomoids in arrangement of these structures. Had he examined genera other than those in the Sehirinae he would have found that other trichobothrial patterns exist in the family. The present author has noticed that four additional arrangements occur in the family so that it is possible to divide the Cydnidae into five subfamilies on the basis of the trichobothria. Further discussion of these subfamilies based on the trichobothria and supporting characters will be found in the discussion under the family heading on a

later page.

Thus, for differentiation of the Cydnidae from all other pentatomoids (except the corimelaenids which were separated above) there are four features of which the three-segmented tarsus is least diagnostic because it is shared with nearly all other pentatomoids. The possession of distinct tibial bristles is shared with a few true Pentatomidae (i.e., Strachia in the subfamily Asopinae); but, if this condition is restricted to a consideration of the lateral marginal row of stout spines on the more or less flattened anterior tibia, it may be considered diagnostic of all genera except Scaptocoris and the extra-limital genus Stibaropus. The presence of a fringe of close-set bristles on the apices of the middle and posterior coxae and the location of the spiracle in the membranous anterior part of the second sternite are nearly unique within this superfamily, being shared only with the corimelaenids. As admitted later in this paper, the leg armature may be simply an adaptive feature for the fossorial habits of these insects and not at all an indicator of phylogenetic relationships. It shows considerable variation from genus to genus. The same criticism may be valid for the coxal bristles which are present only on the ventral or exposed side of the structure where they may be functional in preventing sand and grit from entering the articulation during burrowing. Therefore, even though these features furnish good recognition characters their actual value as indicator of phylogeny within the Pentatomoidea is open to question. This uncertainty in accepting proposed characters for separation of the groups included in the Pentatomoidea once again emphasizes the need for a very thorough study of the higher classification of the group. Until such a study is carried on by someone with access to collections containing

goodly representation of all parts of the Pentatomoidea, the author feels free to follow his usual tendency to be a "splitter" at the family level when the breaks in the morphology and biology of the groups permit a distinct and independent biologic-taxonomic concept to be formed.

The problems in the classification of this group have not been confined to the family level. Instead, they are evident at all levels. Previously only two subfamilies have been recognized, whereas at least five are strongly evident in the material at hand.

Most authors have considered the genera from one of two extremes: either with the idea that any prominent or unusual feature (regardless of its value as a phylogenetic indicator) automatically serves for the establishment of a genus; or, from the other extreme, that the limits of previously erected genera must constantly be expanded to take in new forms that appear regardless of the relationships of the species involved. The former approach has resulted in too many monotypic genera (i.e., Colobophrys Horvath, Cryptoporus Uhler, Pachymeroides Signoret, Psectrocephalus VanDuzee and Syllobus Signoret to mention some from the Western Hemisphere) as often characters of no more than specific value have been used; while the second method has resulted in a few "catch-all" genera (i.e., Aethus and Geotomus as accepted by most recent authors) that have world-wide distribution and consequently little or no zoogeographic significance. The present author believes that if a genus is to consist of a group of "closely related" species consideration must be given not only to the characters which separate the species, but also to those which two or more species may have in common. This approach appears to be establishing a series of

genera which are not only composed of "closely related" species, but also have restricted ranges of some zoological significance.

At the species level there have been much confusion and great uncertainty concerning the application of trivial names. In great part, this uncertainty has been due to the fragmentary and at times inaccurate original descriptions, and in part to the assignment of forms to the wrong genus. Many of the keys that have appeared have been drawn from misdetermined material and so could only lead to further error. Even some of America's outstanding hemipterists have been inconsistent in their assignments of names so that in the material available for study some species were determined first as one thing and later as another by the same worker. This point is brought up not to condemn the work of these men, but simply to show that even careful students were confused by the literature. Probably the most misused name in the cydnid literature of the Western Hemisphere was Uhler's Pangaeus discrepans. It was found attached to no less than five distinct species in three different genera, while specimens of true discrepans were found under three other names as well as the proper one. The most accurate determinations appear to have been made on those species which could be placed chiefly on distribution and with a minimum of morphological characters. With the literature and the work of specialists leading to such muddled results, the group has been in dire need of a thorough revision.

The present paper, based wherever possible on types, is offered to enable interested persons to make determinations with a fair degree of accuracy and confidence. True, further studies on Cydnidae from other parts of the world, as well as additional material from the Western

Hemisphere, will probably necessitate certain revisions in some of the conclusions offered here, but the author hopes that this paper will furnish a firm, understandable foundation on which such additional studies might be based.

To accomplish this aim, the present study amounts to a revision of the known species of all included genera except Sehirus of which only one of the twenty-five or more nominal species occurs in this hemisphere. The approach to categories at all levels has been similar and consists of the following topics: 1) name and selected synonymy to show the important events in the history of the group, all other records will be included in a subsequent catalogue; 2) a diagnosis--a concise statement of features most readily used to separate that taxon from all others contained in the next higher category (unless indicated otherwise); 3) a more lengthy description of pertinent characters, which in the case of the specific descriptions includes the mean and extremes of measurements from five individuals (or the number is listed parenthetically if less than this are available) of each sex; color, unless indicated otherwise, may be assumed to be the usual brownish-black to black (yellow or light brown in teneral specimens) without conspicuous or important markings; 4) information about the types of both old and new categories; 5) a generalized statement of distribution; 6) discussion of any items deemed worthy of note; 7) a key to any named forms included in the taxon under consideration; and 8) in the case of species, a list of specimens studied; for new species and species for which less than ten locality records were available full label data are copied, but for commoner species, those with ten or more localities represented, the data are somewhat condensed to conserve space.

LITERATURE AND HISTORICAL REVIEW

The written history of this group began in 1803 with Fabricius' description of the genus Cydnus in spite of the fact that some of the species had been described previously by Fabricius and Linnaeus in the latter's inclusive genus Cimex. Cydnus originally contained fifteen species, of which several (including the American species lugens and umbraculatus) have subsequently been shown to be non-cydnids. In 1820 Billberg gave the first supra-generic recognition of the group when he referred to it as the "Cydnides." This event has generally been conceded to mark the historical beginning of the family name.

The subsequent literature was mostly of a descriptive or listing nature with few efforts at revisionary or synoptic work. Of the latter, the important ones for cydnid studies in the Western Hemisphere began with Amyot and Serville's (1843) foundation for the modern systematics of hemipterology in their "Histoire Naturelle des Insectes, Hemipteres." The work appears quite sound in assembling and presenting a table to the known genera (eight of them new) of the world. The genera, which in definition and extent seem quite modern, were further arranged into two "Groupes" or subfamilies, the "Cydnides" and the "Sehirides." The soundness of these two categories is confirmed by their almost universal use by subsequent authors. The next important works with a world scope were the catalogues of Dallas (1851) and Walker (1867). Except for Dallas' table to the known genera, both of these works were enumerations with descriptions of new forms.

During this latter period, 1851-1867, exclusively American studies began to appear. These started with Stal's studies, one on the Argentine forms (1860) and one on the Mexican forms (1862). They contained several new genera and species but nothing of a synoptic nature. In 1875 Uhler began a series of contributions which proposed new genera and species in that year and the next, and eventually, in 1877, led to a "Monograph" of the Cydnidae known to occur in North America. Uhler's works, which first introduced the use of the important osteolar structures, appear to have been inclusive and careful studies and not to have exhibited excessive generic splitting as certain later authors seem to have believed. Very shortly after Uhler's "Monograph" Carlos Berg (1879, 1884 and 1894) published some important studies on Argentine and Brazilian forms. Unfortunately, even though Berg was corresponding with Stal, his identifications were not reliably accurate and his descriptions were not diagnostic. In 1880 the first volume on the Rhynchota in the now-famous Biologia Centrali-Americana appeared. The list of cydnids known from the included territory, including descriptions of new forms, was by Distant. No keys were given in the cydnid section and the colored illustrations offer little help in identifying the species.

Returning again to publications with a world-wide scope one finds a list of known species in Stal's (1876) "Enumeratio." In 1879 Signoret began a series of cydnid studies which eventually culminated in a "Revision" which appeared in a series of papers from 1881 to 1884. This "Revision," the only attempt to include all the forms of the world in a single such study, contained a key to genera, descriptions of genera and species and 228 attractively executed illustrations. Unfortunately, the fine appearance

of the paper is misleading when an attempt is made to use it. There are several serious errors in the key, the descriptions and illustrations are often inaccurate and certain earlier species are omitted. In addition, the generic conclusions presented there are not supported by the present study, particularly those which led Signoret to synonymize many of Uhler's genera and to create a number of monobasic genera. The "Catalogue General des Hemipteres" by Lethierry and Severin (1893) was the last major catalogue[1] including all the species for the world.

Since the turn of the century several papers have appeared and presented keys to permit identification of cydnids from one or more countries within the scope of the present paper. They were Barber and Bruner's (1932) Cuban study, Barber's (1939) report on most of the Hemiptera of Puerto Rico and the Virgin Islands and Torre Bueno's (1939) "Synopsis" of the Hemiptera of America north of Mexico. The first two of these appear to be too fragmentary to be of much use, even in the territory for which they were designed; while the latter was obviously taken directly from the literature and so offered no real innovations except to introduce

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[1] Kirkaldy's second part of his general catalogue of the Hemiptera had been completed in manuscript and partially in galley proof at the time of his death. Unfortunately, this second part of the catalogue was never brought to publication. Instead the manuscript and partial galley proof were eventually deposited in the United States National Museum. Through the very generous cooperation of Dr. Reece Sailer of that institution the manuscript and galley proof were entrusted to the present author during these studies. They have been of inestimable value. Some consideration was given to the possibility of bringing Kirkaldy's catalogue to publication, but the great number of changes in generic assignment of species necessitated by redefinitions of genera prevents any such move until the author completes his studies on all genera of the world.

a new error. The first check-list of North American Cydnidae was Uhler's (1886) "Checklist." VanDuzee (1904), Banks (1910) and VanDuzee (1916 and 1917) followed with their catalogues for the same territory. For the tropical part of the hemisphere there have appeared only two checklists that have attempted to review much material in this group and consequently were able to list more than one or two species. One of these lists was by Pennington (1920) for Argentina and the other by Wolcott (1948) for Puerto Rico.

In the above-mentioned studies and certain other less extensive, but surely no less important papers, there have been proposed 146 species of the Western Hemisphere; these have involved thirty-six generic names in the systematics of the Cydnidae of the New World. As might be expected, many of the specific names are just synonyms of the commoner species of the area. This compares with the present study in which 159 species are treated in sixteen genera.

TAXONOMIC MORPHOLOGY

The family Cydnidae comprises a superficially monotonous group of spinose, usually unicolorous, similar forms. This is even more descriptive of the species of the Western Hemisphere than of those of the Eastern Hemisphere where several show interesting color patterns. But this similarity is more apparent than real. There are numerous, easily-used characters which permit the arrangement of most of the species into clear-cut, often readily recognized groups.

A brief summary of the morphology of the Cydnidae with emphasis on those features used more commonly in this study will aid in interpreting the following classification and descriptions (see Figs. 17 and 18 for general figures of the gross anatomy). The characters most employed in the taxonomy of the Cydnidae are derived from the vestiture (including the punctures from which the hairs arise), the osteolar structures, the venation of the posterior wings, the modifications of structural shapes and relative lengths of body parts, the surface sculpture and the genitalia.

The head presents several features for use in generic definition: the number of antennal segments may be four or five, with the second sometimes very short (Fig. 65), and usually with small, very narrow, weakly sclerotized "ring segments" (not to be counted) between segments III and IV and between IV and V. The labium is always of four segments, of variable length, simple or with a semicircular foliaceous lobe on

segment II. The head bears two types of vestiture, first the primary setae which arise from a series of punctures, and appear to be a constant and basic feature of nearly all species except those in Sehirus. There are usually three primary setae present, one on the apical half of each jugum, one anterior to the inner half of each eye and one in the lateral angle of the preocular part of the head (Fig. 43), or there may be more present, as in Amnestus which has four (Fig. 59), or fewer as in Ectinopus which has two (Fig. 66) or there may be none, as in Sehirus. The secondary type of vestiture shows considerable generic and specific variation and consists of a variable row of setigerous punctures which may extend from the eye to the apex of the head where the tip of the clypeus is involved, or the row may be partial or reduced to a single setigerous puncture anterior to the eye. This single puncture is, in reality, the lateral primary puncture, but because it is usually incorporated in the row of secondary submarginal setigerous punctures, it may be discussed more clearly as a member of that series. The setae that arise from these submarginal punctures may be long, slender and hair-like, referred to here as "hairs," or they may be short, stout and blunt "pegs;" interpretation of these types of submarginal setae is difficult because the burrowing habits of the insects may cause the hairs to be broken off near the base and the remaining part will be short and blunt, suggesting the pegs. The absence or presence of ocelli in American Cydnidae appears to be a specific feature, as do the location of the ocelli in relation to the eyes, the surface sculpture, the length of the antennal and labial segments, the relative lengths of the juga and clypeus and the development of the bucculae.

The features offered by the prothorax, except for the presence or absence of a sharply impressed, subapical line paralleling the anterior margin from side to side, appear to be chiefly of specific value. In several genera certain species show a sexual dimorphism in that the lateral margins of the male pronotum are noticeably constricted, while those of the female are entire. Although such a feature might be conspicuous, it is extremely variable within the group, and often within one species; because it appears of questionable survival value and surely of no phylogenetic significance it should not be accorded more than specific importance. Most species other than those of the genus Sehirus present a lateral, submarginal row of setigerous punctures laterally. The arrangement and number of these setigeous punctures furnish good specific features. The pronotal surface is divided into an anterior and posterior lobe by a more or less distinct transverse impression near or behind the middle. The anterior lobe is often modified in the males; it may be tumid and/or variously impressed medially near the apex. The posterior lobe shows a somewhat nodular prominence, or umbone, near each lateral margin; and differing surface sculpture. Anteriorly, on either side of the midline of the prosternum there may be present a longitudinal ridge--the prosternal carinae.

The dorsal surfaces of the meso- and metathoraces, except for the scutellum of the latter, are usually hidden from view and so have been little used for taxonomic characters. In all species, except those of Amnestus, the scutellum is typically pentatomoid in that it is very large and surpasses the apices of the clavi, preventing the latter from coming together to form a claval commissure. Therefore, it is quite surprising to find that in Amnestus the scutellum is very short, permitting the

clavi to reach beyond its apex and form a claval commissure. The scutellum itself varies in ratio of length to basal width and in having the apex narrowed (Fig. 79) or not (Fig. 80). The subapical width of the scutellum at the level of the claval apices is often a useful measurement when compared with the width of the membranal suture, the line of union between the apex of the corium and the base of the membrane. The ventral aspects of the meso- and metathoraces furnish a number of characters of generic, subgeneric and specific importance. In the present paper the area laterad of the coxal insertions is referred to as the pleuron, that between the coxal insertions as the sternum. A dull, finely roughened evaporatorium may be present or absent on the pleurae of one or both segments; its occurrence plus its extent may be of varying value depending on the species under consideration. The punctation in the polished area laterad of the evaporatorium, referred to as "lateral area" for short, may be of specific value. The metapleuron bears the external opening of the scent gland, usually referred to as the osteolae. The osteole occurs in a cuticular modification referred to here as the peritreme. The peritreme consists of a pair of close-set transverse ridges which may or may not be in contact along their summits, the anterior ridge is usually more strongly developed and frequently modified beyond the osteolar opening. When present, this apical modification furnishes good characters for definition of genera. The osteolar opening may be situated ventrally on the peritreme, or posteriorly where it is concealed by a projecting ledge. In Amnestus the middle carina of the meso- and metasterna is strongly elevated, separating the coxal cavities.

The basal thickened part of the anterior wing is divided into three main areas, the clavus next to the scutellum, the triangular discal area or mesocorium between the clavus and the radial vein, and the narrow exocorium between the radial vein and the costa. The distinctness, relative sizes and punctation of these areas plus the presence or absence of a variable number of setigerous punctures on the costa furnish very useful specific characters. The venation of the posterior wing, especially in the anterior part, has yielded some valuable features for defining subfamilies. The veins of the metathoracic wings are somewhat confusing due to fusions and the presence of only incomplete segments of others. This has led to a difference in terminology concerning them. The conclusions presented by Malouf (1932) for the pentatomid Nezara viridula appear applicable and are used here (Fig. 167). The anterior-most vein, Sc+R, is distinctly sclerotized from base to a subapical fracture, beyond which it is much weaker. Apically Sc+R and M are connected either by a cross-vein, r-m, or by running together. In some cases, M sends an oblique spur or hamus into the radial cell near its midlength.

The legs furnish many characters in the shape of parts and the number and arrangement of the spines. Special modifications, such as the anterior tarsal insertions at or proximad of the tibial apex; the diameter of tarsal II in relation to I and III; the shape of the tibiae, especially the posterior ones; the presence or absence of ventral armature on the femora, and others are very usable features.

The dorsum of the abdomen has not yet been extensively explored for characters but does appear to present some. The sternites, however, furnish a number of very important characters for use at all levels

within the family. There are always seven pregenital sternites, but the entire first sternite and the anterior part of the second, including the spiracle of the latter, are membranous, inseparable and usually concealed from view. The complete sternites on which spiracles are visible are III to VII. In the male, sternite VIII also bears a spiracle but is telescoped into the apex of the abdomen. The male genital capsule in Hemiptera has been shown by Bonhag and Wick (1953) to be composed ventrally and laterally of the fused gonocoxopodites and dorsally of the last three abdominal segments, IX, X and XI. These authors further pointed out that the structures commonly referred to as the parameres are actually the gonostyli or claspers. By definition the paramere is a lateral appendage of the phallobase, not of the gonocoxopodite. As yet, the author has not explored the phallic structures for taxonomic worth in the Cydnidae, but there is no reason to believe that they will prove to have any less value here than has been demonstrated for other pentatomoids by Leston (1952) and other workers. As shown by Bonhag and Wick (loc. cit.) for the banded milkweed bug, Oncopletus fasciatus, abdominal segment VIII of the female is visible dorsally as a dorsal plate flanked by a pair of laterotergites which bear one spiracle apiece. Since the pentatomoids apparently do not possess an ovipositor the homologizing of the female terminalia with those of the lygaeid Oncopeltus is not reliable without a more intensive study than could be undertaken at the present time. Laterally in the spiracular area of sternites III to VII there occurs a pair of sensory hairs or trichobothria. Just what it is that the hairs "sense" appears controversial. When Hansen (1917:258) reviewed and discussed the subject of external sensory hairs he concluded, "But I think I have shown

with tolerable certainty that the trichobothria in terrestrial Arthropods are scarcely auditory organs but tactile hairs of special structure." Tullgren's (1918) study of the trichobothria on Hemiptera contained illustrations of them and resulted in some interesting speculations on their role in the higher classification within the order. His conclusions on the Cydnidae were based on an unfortunate choice of two genera of the subfamily Sehirinae; all members of that subfamily agree with the Pentatomidae proper in having two trichobothria arranged in a transverse row behind each spiracle. If he had chosen genera of any other subfamily he would have realized that other patterns also existed in the family. In fact, the present study recognizes four additional arrangements, making it possible to establish five subfamilies on the basis of the trichobothrial arrangements in both the nymphs and the adults. These categories can be supported by additional features derived from other parts of the body. For further information on such use of the trichobothria the reader is referred to the discussion under the family heading.

Measurements were taken in a standard manner: width and length of head, transverse ocellar width and size of space separating eye and ocellus were taken from a dorsal view of the head which placed the greatest expanse of outline at right angles to the line of vision; the greatest length of antennal and labial segments was taken from side view; the pronotum was held so that a plane through the margins was at right angles to the viewer and the length was measured along the midline and the width across the humeri; the scutellum likewise was held at right angles to the line of vision and the length was taken along the midline from the bottom of the basal transverse impression to the apex, and the width was measured

basally with the lateral ends of the curved basal impression forming the points of limit. The total length of the insect is that of the body alone, the position of the membrane being too variable to give a fixed point for measuring; but even the "length of body" is not as accurate as might be desired because the position of the head often varied from specimen to specimen.

The term alutaceous does not appear to have common usage in hemipterology but is very helpful in describing the surface microsculpture of some of these insects. When a surface is alutaceous it appears dulled due to the presence of numerous minute, intersecting cracks and wrinkles like those on the surface of human skin.

FAMILY CYDNIDAE BILLBERG

1820 Cydnides Billberg, Enum. Ins. Mus. Billberg, p. 70.

Size small to large, 1.6-16.1, oblong to oval, dorsum subdepressed to strongly convex, venter strongly convex. HEAD: quadrate to semicircular, more or less widened or explanate laterally; antennae four- or five-segmented, inserted ventrally on head near ventral angle of eye; ventral surface of eye attaining posterior margin of head; labium four-segmented, inserted beneath or near apex of clypeus, surpassing base of head, sometime reaching well onto abdomen. THORAX: pronotum large, concealing meso- and metanotum except for the usually very large, triangular or subtriangular scutellum; clavus and corium opaque, latter subtriangular, broadened at apex, frenum reaching beyond middle of scutellum; membrane with veins usually weak, simple or anastomosing; legs more or less strongly spined on tibiae, especially anterior pair which are more or less flattened and have single row of very stout, blunt spines on lateral margin (except in Scaptocorinae); middle and posterior coxae with apical fringe of close-set bristles (Fig. 114); tarsus three-segmented (absent from posterior legs of Scaptocoris). For additional discussion of family definition within the Pentatomoidea see introduction to the present paper.

Biological information concerning the Cydnidae is scattered and mostly fragmentary. But from what has been published there may be deduced a rather incomplete outline of the life cycle. Biologically the Cydnidae may be considered in two groups: first, those like the species of Sehirus (not necessarily all Sehirinae) in which both the nymphal and

adult stages feed on parts of plants that grow above ground and in so doing closely resemble the activities of the great percentage of the Pentatomidae. The second type, which is apparently characteristic of species of all cydnid genera except Sehirus, involves nymphal and adult feeding on roots and possibly other underground parts of plants. This habit of underground feeding has suggested for the family the popular name of "burrower bugs."

Although no life history of an American cydnid has appeared in literature, the activities of Sehirus cinctus (Beauvois) probably can be predicted somewhat from results published on certain European members of the genus. Southwood (1949) and Southwood and Hine (1950) have given a rather full account of Sehirus bicolor (Linnaeus) in England and an abstract of their "Notes" may indicate what can be expected of Sehirus cinctus in North America. Adults hibernate under soil. In spring they become active, mate and lay some forty eggs in a cluster in the soil or under protective leaves or stones. The female remains close above the ball of eggs, apparently ready to defend it. The incubation period varies from eighteen to twenty-four days. The nymphs and adults usually remain together for about forty-eight hours after hatching. They feed on the above-ground parts of plants, chiefly those of the family Labiatae, with most nymphal feeding apparently concentrated on the floral or fruiting parts of the plants. About seven weeks are required to reach maturity. Since there is only one generation each year the adults must live about nine months. Adults of bicolor had also been collected from other plants. The life history of another European Sehirus, S. sexmaculatus Rambur, was reported by Boselli (1932); except for minor details the two life histories are very similar.

Scattered notes on life histories of cydnid genera other than Sehirus indicate that they are chiefly root-feeders in nymphal and adult stages. They apparently hibernate as adults and begin reproduction in spring. Some forms have been reported (see Carvalho, 1952:1) as feeding on roots "two meters below the surface of the soil" where they were associated with root galls some four inches in diameter. Such subterranean activities are an effective shield against observation, and unless some of these insects become of major economic importance there is little likelihood that anyone will attempt to make a detailed study of the life history of even one of them.

In the classification of the Cydnidae, the first subdivision into supra-generic segments appeared in Amyot and Serville (1843) where the two "groupes" "Cydnides" and "Sehirides" were established chiefly on the shape of the anterior tibiae. "Cydnides" was described as having the anterior tibia broader and flatter with strong spines on the outer margin in all included genera except Scaptocoris; "Sehirides," in contrast, was said to have the anterior tibiae only slightly flattened and to be without strong spines on the outer margin.

This division on the same characters was accepted by Stal (1864) who latinized the names and added the narrow filiform shape of the tarsus of the Cydnida and the more slender second tarsal segment of Sehirida. This separation was used by Stal and subsequent authors until Signoret (1881b) proposed that these two groups be separated on the basis of the presence or absence of certain setigerous punctures on the head and thorax. Signoret's characterization kept most of the genera in the same groups in which earlier workers had placed them, but did require the shifting of

Lobonotus Uhler to the Sehirides. This shift is not supported by findings in the present study. These two taxa have long been considered the primary categories in the Cydnidae. No other supra-generic separation occurred until Hart (1919) recognized the abberant conditions exhibited by Amnestus and erected the tribe Amnestini for it.

In evaluating the characters mentioned above, one must conclude that the expanded anterior tibia is undoubtedly an adaptive feature--an adaptation to a burrowing habit--and as such probably does not deserve consideration as a prime phylogenetic indicator, though it may have value as a convenient key character. The presence of setigerous punctures on the submargin of the head and thorax is also probably adaptive in supplying tactile hairs for the burrowing habit. The narrower second tarsal segment pointed out by Stal (loc. cit.) probably could be construed as giving greater flexibility of the tarsus for the plant-climbing habit of the members of the genus Sehirus in which it occurs; while the other forms which are chiefly burrowers would require the stout, more rigid tarsus for efficient handling of the soil.

The present investigation to find more reliable phylogenetic indicators resulted in the selection of certain features which have already shown such value in other pentatomoids, namely the arrangement of the trichobothria on the heavily sclerotized sternites III to VII (Figs. 170-174) and the pattern of the venation of the posterior wing. The arrangement of the trichobothria in both the nymphs and the adults indicates five major groups of Cydnidae as tabulated below:

A. Sternites III and IV without trichobothria, V to VII each with a single trichobothrium posterior to the spiracle (Fig. 173) . .

. . . . . Amnestinae

AA. Sternites III to VII each with two trichobothria.

B. Trichobothria of sternites III to VII posterior to spiracles.

C. Trichobothria arranged in transverse pairs (Fig. 171). .

. . . . . Sehirinae

CC. Trichobothria arranged in longitudinal pairs (Fig. 174).

. . . . . .Garsauriinae

BB. Ventral-most trichobothrium of anterior sternites (or all sternites) mesad or anterior to spiracle.

D. Sternites III to VII with one trichobothrium more anterior in position than spiracle and one (not always strongly developed) posterior to it (Fig. 170) . Scaptocorinae

DD. Trichobothria of sternites VII and usually also of VI both posterior to spiracle (Fig. 172) . . . .Cydninae

The arrangement of the trichobothria on the several posterior segments in the Cydninae is contrary to the statement of McAtee and Malloch (1933:194) that Thyreocoridae and Cydnidae "with the exception of the Sehirinae, have the trichobothria longitudinally arranged often nearly in line with the spiracles." The present grouping of the Cydnidae into five subfamilies can be given additional support from characters drawn from the venation of the posterior wing, as explained below.

The first taxonomic use of the venation of the hind wing was by Fieber (1861) who employed it in the first couplet in his key to the European genera, but did not establish any named categories upon the results. Unfortunately, his choice involved the close approximation of the basal halves of the Sc+R and M, a feature which apparently occurs with

some irregularity in the Cydninae so that even otherwise closely allied genera may not agree in this character, though they may agree in it with more distantly related forms. The results of the present study of venational features (Figs. 165-169) permits forming the following table which agrees with the results obtained above from the trichobothria.

A. Sc+R recurved at apex to meet M (Fig. 168). . . . . Amnestinae

AA. Sc+R straight, connected to M by a more or less strongly oblique cross vein.

B. Cross vein r-m very strongly oblique so that M_{1+2} leaves radial cell basad of fracture in Sc+R (Fig. 165). Scaptocorinae

BB. Cross vein r-m not so strongly oblique, M_{1+2} leaving radial cell beyond fracture in Sc+R.

C. Vein M with a spur or lobe projecting into radial cell at its midlength.

D. Three veins arising independently from apex of radial cell (Fig. 169) . . . . . .Garsauriinae

DD. Two of the three veins arising at antero-apical angle of radial cell, third one from postero-apical angle (Fig. 166) . . . . . Sehirinae

CC. Vein M without trace of spur or lobe projecting into radial cell (Fig. 167) . . . . . Cydninae

Thus, with evidence drawn from two non-adaptive characters of the Cydnidae it is possible to establish five subfamilies. Unfortunately, both of these features are somewhat difficult to use, either because of their small size or the fact that they are normally hidden from view. But a survey of the other characters of these insects shows that a much more

usable key to the subfamilies can be based on certain more conspicuous characters. Such a key to the subfamilies follows:

General Key to the Subfamilies of Cydnidae

1. Clavi meeting beyond short scutellum and forming a commissure almost as long as scutellum (Fig. 2). . . . . Amnestinae p. 26

   Clavi not meeting beyond scutellum, not forming a claval commissure. 2

2. Anterior tibia strongly cultrate, much produced beyond tarsal insertion so that tarsus appears to arise at middle of tibial length (Fig. 3) . . . . . Scaptocorinae p. 48

   Anterior tibia not cultrate, tarsus arising at or very near apex of tibia 3

3. Pronotum with a lateral, submarginal row of setigerous punctures, tarsal II subequal in diameter to I and III . . . . Cydninae p. 65

   Pronotum without a lateral, submarginal row of setigerous punctures; tarsal II distinctly narrower than I and III. 4

4. Antennal II as long as or longer than I; pronotum without fine, distinctly impressed subapical groove . . . . . Sehirinae p. 27

   Antennal II less than half as long as I; pronotum with fine, distinctly impressed subapical groove paralleling anterior margin (Fig. 65) . . . . . Garsaurilnae p. 46

SUBFAMILY SEHIRINAE AMYOT AND SERVILLE

1843 Sehirides Amyot and Serville, Hist. Nat. Hemip., p. 96.

DIAGNOSIS: Either the arrangement of the two trichobothria of sternites III-VII in a transverse row posterior to the spiracle (Fig. 171) or the venation of the metathoracic wing (Fig. 166) (shape of radial cell and presence of a hamus) will define this group in the technical sense. But for greater ease of identification of the sole species of the only genus that occurs in the Western Hemisphere one may rely on the narrow, creamy-white lateral margins of the pronotum, corium and abdomen.[1]

DESCRIPTION: HEAD: margins entire; antennae five-segmented; labial II simple. WINGS: posterior wing (Fig. 166) with r-m joining M distad of fracture in Sc+R; Sc and R leaving radial cell at antero-apical angle; radial cell receiving hamus from M. SCUTELLUM: long, surpassing apices of clavi, latter not forming commissure posterior to scutellar apex. THORACIC PLEURAE: posterior margins well-developed; propleuron with anterior and posterior convexities; mesopleuron with posterior margin touching or overlapping anterior edge of metapleuron for most or all of width; metapleuron with posterior margin reaching base of abdomen across full width, completely covering internal part of hind coxa. LEGS: anterior tibia weakly compressed, with row of small blunt spines on dorsal margin; tarsi inserted at apices of tibiae, with II more slender than I or III.

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[1] One other species in the New World has a creamy-white costa but it lacks the pale edges on the pronotum and abdomen.

STERNITES: (Fig. 171) sutures nearly straight, not sinuate laterally; III to VII each with two trichobothria in transverse row behind spiracle. TERMINALIA: male genital capsule opening dorsally.

TYPE OF SUBFAMILY: genus Sehirus Amyot and Serville (1843:96).

DISTRIBUTION: Members of the Sehirinae have been reported from all major faunal regions of the world except the Australian and Neotropical. The range of the single New World species extends southward from southern Canada into Mexico.

DISCUSSION: This subfamily, as defined here and in the key to subfamilies, is now known to contain the two genera Legnotus Schiodte (=Gnathoconus Fieber, vide China, 1943) and Sehirus Amyot and Serville. As other extra-limital genera are studied perhaps more will be added to it. But of these, only Sehirus has been found in the Western Hemisphere. For fuller discussion of this genus the reader is invited to consult the additional notes given below.

Genus Sehirus Amyot and Serville[1]

1843 Sehirus Amyot and Serville, Hist. Nat. Hemip. p. 96.

1843 Tritomegas Amyot and Serville, Hist. Nat. Hemip., p. 98.

1866 Canthophorus Mulsant and Rey, Ann. Soc. Linn. Lyon, new series, 13:344.

1866 Adomerus Mulsant and Rey, Ann. Soc. Linn. Lyon, new series, 13:356.

1881 Lalervis Signoret, Ann. Mus. Civ. Stor. Nat. Genova, 1881:216.

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[1]Pending the completion of the author's studies of the Cydnidae of the Eastern Hemisphere, the conclusions of China (1943) concerning this genus are here accepted without question. The decision to do this was a practical solution to a very complex problem which would have involved review of a very extensive literature on a genus whose main area of distribution is removed from the geographic region under consideration.

DIAGNOSIS: Among the many genera of the Western Hemisphere this one may be recognized by any of many features, i.e., 1) weakly compressed anterior tibia which is almost square in cross-section; 2) lack of distinct prosternal carinae; 3) creamy-white lateral margins to pronotum, corium and abdomen; 4) the scimitar-shaped terminal process of the osteolar peritreme; and others.

DESCRIPTION: (based primarily on the New World forms but modified to encompass all Old World forms[1] available). Size small to moderate; oval, widest behind middle; dorsum moderately convex, venter more strongly so. HEAD: length usually more than three-fourths of width, eyes projecting by half or more of their width; juga equal to or longer than clypeus, sometimes convergent or contiguous beyond clypeus; surface convex or concave, margins narrowly to broadly reflexed, closely and coarsely punctured over most of surface; ocelli present, small, situated on or behind a line connecting hind margin of eyes; antennae five-segmented, I shortest, IV subequal to or shorter than V, each longer than II and III, latter subequal to or longer than II, bucculae moderately to very high, nearly or quite reaching base of head, evanescent or abruptly terminated posteriorly, labium reaching between middle of hind coxae, I shortest, II longest, III longer than IV, II slightly compressed but without a foliaceous semicircular lobe. PRONOTUM: length not more than half of width, margin carinate, sides convexly narrowed from base, without lateral submarginal

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[1]The Eastern Hemisphere species at hand during this study included bicolor Linnaeus, biguttatus Linnaeus, dubius Scopoli, luctuosus Mulsant and Rey, sexmaculatus Rambur and one unidentified Oriental species.

row of setigerous punctures; anterior margin slightly to moderately deeply concave; transverse impression moderate to obsolete, marked by a wide band of distinct punctures; posterior margin broadly but very weakly convex; all angles rounded. SCUTELLUM: longer than broad, triangular, apex narrowed and less than half of membranal suture; disk with numerous distinct punctures over most of surface. HEMELYTRA: areas well defined, membranal suture straight, convex or moderately bisinuate; corium and clavus distinctly, closely and more or less uniformly punctured; costa thickened, impunctate, inflexed part distinctly punctate; membrane less than half of hemelytral length, reaching or surpassing apex of abdomen, transparent and weakly to strongly clouded with brown. PROPLEURON: usually punctured, sometimes tuberculate; prosternal carinae very low or absent, anterior margin usually without expansions. MESOPLEURON: (Figs. 86 and 87) nearly flat, evaporative area restricted to posterior two-thirds or less, often reaching side margin where it is sometimes extended anteriorly; shining part punctured; mesosternum distinctly carinate on midline. METAPLEURON: (Figs. 86 and 87) slightly convex; terminal lobe of osteolar peritreme elevated, strap-shaped or reniform, more or less shining, longer than basal part; evaporative area either just surrounding osteolar canal or more extensive, sometimes occupying mesal three-fourths of segment; shining part variously punctured. LEGS: moderately long, slender; anterior tibia (Fig. 130) not surpassing tarsal insertion, weakly compressed, dorsal margin with eight to eleven stout spines; middle and posterior (Fig. 138) legs terete; tarsal II shortest, I longest. STERNITES: moderately convex, punctured, more coarsely and closely so laterally; posterior margin of sternites finely denticulate or crenulate. TERMINALIA:

male genital capsule opening dorsally, apical rim entire or broadly and shallowly emarginate.

GENOTYPE: Cimex morio Linnaeus (1761), subsequently designated by Reuter (1888); the several names listed in the synonymy above are accepted on the authority of China (1943).

DISTRIBUTION: The widest range occupied by any genus of Cydnidae belongs to Sehirus. It has been reported, apparently correctly so, from all major faunal regions except the Australian and Neotropical regions. The distribution of the genus within the New World was indicated by specimens as extending from coast to coast across southern Canada and thence south to Florida, Texas, New Mexico and California and into Central America as far south as southern Mexico.

DISCUSSION: In spite of extensive literature to the contrary, the present study found this genus to be the only truly Old World genus to have extended its range into this hemisphere where it is represented by the single species treated below.

In habits the members of this genus are quite different from other cydnids. The species of Sehirus are not burrowers and root-feeders, the common trait that suggested popular name of "burrower bugs" for these insects. Instead, nymphs as well as adults of Sehirus feed on plant parts above the ground. This has exposed their activities to observation and enabled students to report more ecological data for them. Although the life history of the single New World species has not been worked out, the reported fragments of it agree well with the biological studies on European species by Boselli (1932), Southwood (1949) and Southwood and

Hine (1950). For interested readers a generalized life cycle has been extracted from the latter paper and incorporated in the family discussion (p. 20) of the present study.

Sehirus cinctus (Palisot Beauvois)

1805 Pentatoma cincta Palisot Beauvois, Ins. Rec. Afr., et Amer., p. 114, pl. 8, fig. 7.

DIAGNOSIS: This is the only species of the genus known to occur in the Western Hemisphere. The narrow, creamy-white margins of pronotum, corium and abdomen suggested as a ready means of identification of the genus in the New World will serve also to determine this species.

DESCRIPTION: MALE:- oval, broader to posterior of midlength. HEAD: longer than wide; juga reaching or surpassing apex of clypeus, latter slightly narrowed toward apex; margins of juga variously reflexed; surface, except vertex, with numerous close-set, coarse punctures, these more or less confluent into radiating lines toward margins of head; juga ventrally polished, impunctate; maxillary plate distinctly punctured; antennal and labial lengths as given in subspecies descriptions; bucculae reaching nearly to base of head, evanescent posteriorly. PRONOTUM: length less than half of width; transverse impression weak to moderately impressed, marked by a broad band of numerous, distinct punctures continuing finer and sparser over posterior lobe; anterior lobe distinctly and abundantly punctured except on calli; both lobes with minute punctures interspersed between coarser ones. SCUTELLUM: longer than wide; surface mostly punctured, more finely so at apex. HEMELYTRON: Clavus and corium with numerous inter-mixed moderate and minute punctures, the coarser ones

arranged in two rows either side of claval commissure; membranal suture straight, slightly recurved laterally; membrane slightly surpassing apex of abdomen, length little greater than basal width. PROPLEURON: punctured; prosternal carinae obsolete. MESOPLEURON: (Fig. 86) evaporatorium confined to narrow posterior margin, narrowing laterally, evanescent just before reaching lateral margin of segment; remainder polished, distinctly punctured. METAPLEURON: (Fig. 86) osteolar canal transverse narrowly reniform, extending three-fourths across segment; osteole opening ventrally at base of canal between middle and posterior acetabula; evaporatorium just outlining canal; remainder polished, with impressed punctures. STERNITES: shining, becoming closer and more coarsely punctured laterally; without setigerous tubercles laterad of spiracles. TERMINALIA: subgenital segment distinctly flared marginally, apex entire; gonostylus as illustrated (Fig. 188).

FEMALE:- very similar to male, measurements averaging larger (see subspecies descriptions below).

COLOR: Brownish-black, black or bluish-black, coria usually slightly lighter; narrow side margins of pronotum, costae, edges of sternites II to V, edge of subgenital plate of male, last tergite of female, and elongate dash on dorsal face of each tibia creamy-white; antennal II, rostrum and tarsi yellowish-brown.

TYPE DATA: Location of type unknown to author. The type locality given by Palisot Beauvois, "A Agathon, royaume de Benin" in Africa, was apparently in error because Stal (1864) wrote, after examining the type specimen, that the specimen was the common American species described by Say as Cydnus ligatus.

DISTRIBUTION: The range of this well-marked species is quite extensive. It is known to occur across the southern provinces of Canada from Newfoundland to British Columbia, throughout the United States from Maine to Florida and west to California and in Mexico to the Isthmus of Tehuantepec.

DISCUSSION: This extensive range brings the insect into many types of territories. It is, therefore, not surprising to find that some apparent subspeciation is evident. The material studied could be easily divided into three groups on the basis of color and certain intergrading morphological features. One form is northern, occurring across southern Canada and the northern United States; the second occupies most of the United States and Mexico; while the third apparently is restricted to a limited area in central and eastern Texas. With a few specimens at the beginning of this study the conclusions reached were decided and clear cut:- the three forms appeared sufficiently distinct to warrant being considered full species. But as additional specimens filled in the geographic gaps they also began bridging the morphological gaps so that conclusions concerning the three required revision downward. The subsequent specimens fitted well into the pattern established by the earlier findings but did indicate overlapping of certain structural features that had been considered of specific value.

Since not more than 300 specimens of this species were available for study, it is quite desirable that the problem of subspeciation in Sehirus cinctus be attacked mathematically with many times that number of specimens. The habits of this species make it one of the more prominent and more commonly collected cydnids, a fact that should make the accumulation

of many specimens a relatively easy task.

The features which show geographic significance are the head, the corial pattern and the punctures of the sternites. The head shows a progressive shortening in the three forms from the longest condition in the northern one to the shortest in the southwestern form. The northern form has the anteocular length distinctly more than the anteocular width, 55% (52-57%), as compared to a comparable ratio of 45% (41-47%) in the southwestern form. The gap between these figures is bridged by the common southern form, 49% (40-55%). In the northern form the obliquely and very strongly elevated jugal margins are higher than the level of the head (Fig. 19), which is in contrast to the condition in the other two forms where the juga are much less elevated and are lower than the dorsum of the head. In addition, the dorsum of the head of the southern and southwestern forms are closely punctured to the margins, while in the northern form a broad, marginal band is virtually impunctate.

The corium of the northern and southwestern forms have, in addition to the narrow pale costal margin, a prominent, angulated creamy-white mark at the tip of the radial vein. The southwestern form usually also shows a small, rather inconspicuous, premedian whitish spot on the corium. The southern form lacks these additional pale maculations.

In a series of specimens the southern form appears to have the lateral punctures of the sternites weaker and sparser than the same punctures of the other forms. This character, however, is difficult to evaluate and put into words so no further use will be made of it in this study.

The several characters discussed above permit the formation of the following

Key to the subspecies of Sehirus cinctus

1. Jugal margins (in profile) elevated above dorsum of head (Fig. 19); corium with angled whitish mark at apex of radial vein . . . . . albonotatus Dall. p. 36

Jugal margins (in profile) lower than dorsum of head; corium with or without whitish mark at apex of radial vein 2

2. Corium with a prominent, angled, whitish mark at apex of radial vein and usually also an inconspicuous premedian pale dot . . . . texensis n.sp. p. 43

Corium with no pale markings as described above. cinctus (P.B.) p. 39

Sehirus cinctus albonotatus Dallas

1851 Sehirus albonotatus Dallas, List Hemip. Brit. Mus., 1:127.

1876 Canthophorus cinctus Stal, Svenska Vet.-Ak. Handl., 14(4):22.

1877 Sehirus cinctus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 1:281 (part).

1880 Sehirus cinctus Distant, Biol. Centr. Amer., 1: 9 (part).

1884 Canthophorus cinctus Signoret, Ann. Soc. Ent. France, 1884:60 (part).

1893 Sehirus cinctus Lethierry and Severin, Gen. Catal. Hemip., 1:93 (part).

1904 Sehirus cinctus VanDuzee, Trans. Amer. Ent. Soc., 30:26 (part).

1910 Sehirus cinctus Banks, Catal. Nearct. Hemip., p. 101 (part).

1917 Sehirus cinctus VanDuzee, Univ. California Pubs. Ent., 2:24 (part).

1939 Sehirus cinctus Torre Bueno, Ent. Amer., (new series) 19:184 (part).

DIAGNOSIS: The presence of the angled whitish mark at the apex of the radial vein plus the elongate head will separate this subspecies from

the other two.

DESCRIPTION: MALE:- HEAD: wider than long, 1.35 (1.23-1.40): 1.04 (0.96)-1.10); anteocular length slightly more than half of anteocular width, 0.52 (0.46-0.54): 0.87 (0.83-0.96); juga very widely reflexed (Fig. 19), margins thickened, virtually impunctate; antennals, I, 0.29 (0.29-0.30); II, 0.48 (0.38-0.53): III, 0.69 (0.60-0.80): IV, 0.85 (0.70-0.96): V, 0.98 (0.90-1.06); labials, I, 0.39 (0.36-0.42): II, 0.67 (0.63-0.70): III, 0.62 (0.56-0.66): IV, 0.43 (0.40-0.46). PRONOTUM: width more than twice length, 2.85 (2.53-3.00): 1.28 (1.17-1.36). SCUTELLUM: longer than wide, 2.14 (1.95-2.21): 1.81 (1.56-1.89). LENGTH of body, 5.42 (4.72-5.70).

FEMALE: similar to male but somewhat larger and stouter. HEAD: wider than long, 1.42 (1.33-1.51): 1.14 (1.10-1.23); anteocular length more than half of anteocular width, 0.55 (0.50-0.60): 1.00 (0.96-1.06); antennals, I, (0.26-0.33): II, 0.50 (0.48-0.53): III, 0.63 (0.60-0.70): IV, 0.82 (0.76-0.88): V, 0.96 (0.88-1.03); labials, I, 0.39 (0.36-0.43): II, 0.72 (0.70-0.76): III, 0.65 (0.53-0.70): IV, 0.50 (0.47-0.53). PRONOTUM: width: length::3.23 (2.93-3.52): 1.50 (1.43-1.56). SCUTELLUM: length: width:: 2.50 (2.21-2.66): 2.05 (1.82-2.28). LENGTH of body, 6.13 (5.70-6.45).

TYPE DATA: Type in the collection of the British Museum of Natural History, London, England. Dallas' original type locality of "St. John's Bluff, Florida" is open to question. His description of the pale spot on the apex of the corium and the large size (given in lines and undoubtedly measured so as to include projecting membrane) can be applied only to the present, northern form. Since none of the specimens available for this study and none of them otherwise reported in literature from Florida appear

to have had this spot, the conclusion must be accepted that Dallas' specimen was mislabelled. The true type locality must have been much farther north.

DISTRIBUTION: This northern subspecies is definitely known to occur across the provinces of southern Canada from Newfoundland to British Columbia and in the northern United States as far south as New York, Michigan, northern Illinois, central Iowa, Wyoming and northern California. This southern limit of range roughly approximates north latitude 41°.

DISCUSSION: The reported habits of this subspecies differ in no important respects from the life histories that have been worked out for European species: the present form hibernates as an adult (Parshley, 1923); feeds on labiate plants in the young stages (VanDuzee, 1905); and as imago has a variety of feeding tastes, adults having been reported from various plants, especially Scrophulareacea (Provancher, 1886), from wild raspberries (Parshley, 1923) and from Compositae, Cyperaceae and Graminae (Hendrickson, 1930). It appears to be adaptive to a variety of habitats as indicated immediately above and by reports that it has also been taken under boreal conditions on the summit of Mt. Greylock at some 3,500 elevation (Parshley, 1920). One report (Torre Bueno, 1915) said that even this species has the ability to burrow "into the sand for shelter."

SPECIMENS STUDIED: 82 males, 81 females. NEWFOUNDIAND: Nicholsville; July. CANADA: Alberta: Peace River. Manitoba: Cedar Lake, Deepdale; July-August. Ontario: Port Sidney; July. Quebec: Granby, Mattapedia; July-August. UNITED STATES: California: Meadow Valley (Plumas Co.); June. Colorado: Boulder. Illinois: Algonquin, Waukon; June-August. Iowa:

Ames, Boone, Eldora, Little Rock; June-August. Maine: Bar Harbor, Eastport, Kingfield, Lovell, Monmouth, Orono, Weld, Westpoet; April-September. Massachusetts: Boston, Humarock, Salem; July. Michigan: Cheboygan Co., Chippewa Co., Douglas Lake, Emmet Co., Gogebic Co., Iron Co., Mackinac Co., Marquette Co., Oceana Co., Tuscola Co.; May-August. Minnesota: Pequot Lakes, Traverse Co.; September. New Hampshire: Bretton Woods, Franconia, Glen, Mt. Washington, Randolph; June-August. New York: Buffalo, Catskills, Colden, Cranberry Lake, Greene Co., Hamburg, Keene Valley, Murray Bay, New York, North Elba, Paradox, Westport; June-September. North Dakota: Fargo, Mankinsen; July-September. Pennsylvania: Germania; July. Vermont: Grand Isle, Jay; July. Wisconsin: Belle Plain, "Winn.Co."; July. Wyoming: Gurney; July.

Sehirus cinctus cinctus (Palisot Beauvois)

1805 Pentatoma cincta Palisot Beauvois, Ins. Rec. Afrique Amerique, p. 114, pl. 8, fig. 7.

1831 Cydnus ligatus Say, Descr. N. Sp. Hemip. N. Amer., p. 10.

1843 Sehirus cinctus Amyot and Serville, Hist. Nat. Hemip., p. 97 (cites erroneous African type locality).

1864 Sehirus cinctus Stal, Hemip. Africana, p. 29 (corrects type locality to America).

1867 Sehirus cinctus Walker, Catal. Hemip. Brit. Mus., 1:169 (uses erroneous African type locality).

1876 Canthophorus cinctus Stal,

1877 Sehirus cinctus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 1:281 (part).

1880 Sehirus cinctus Distant, Biol. Centr.-Amer., Rhynchota, 1:9 (part).

1884 Canthophorus cinctus Signoret, Ann. Soc. Ent. France, 1884:60 (part).

1893 Sehirus cinctus Lethierry and Severin, Gen. Catal. Hemip., 1:93 (part).

1904 Sehirus cinctus VanDuzee, Trans. Amer. Ent. Soc., 30:26 (part).

1910 Sehirus cinctus Banks, Catal. Nearct. Hemip., p. 101 (part).

1917 Sehirus cinctus VanDuzee, Univ. California Pubs. Ent., 2:24 (part).

1939 Sehirus cinctus Torre Bueno, Ent. Amer., (new series) 19:184 (part).

DIAGNOSIS: The lack of pale spots on the corium appears sufficiently diagnostic for the recognition of this species.

DESCRIPTION: MALE:- HEAD: wider than long, 1.12 (1.03-1.20): 0.88 (0.80-0.93); anteocular length averaging just about half (49%) of anteocular width, 0.36 (0.33-0.40): 0.73 (0.68-0.76); jugae narrowly reflexed, margins acute, punctured nearly or quite to edge; antennals, I, 0.22 (0.20-0.23): II, 0.38 (0.36-0.40): III, 0.47 (0.43-0.53): IV, 0.65 (0.63-0.71): V, 0.84 (0.80-0.93); labials, I, 0.33 (0.30-0.36): II, 0.57 (0.54-0.60): III, 0.57 (0.53-0.60): IV, 0.40 (0.40-0.40). PRONOTUM: width more than twice length, 2.45 (2.21-2.60): 1.13 (0.97-1.17). SCUTELLUM: longer than wide, 1.82 (1.52-1.95): 1.48 (1.30-1.60). LENGTH of body, 4.55 (4.05-4.80).

FEMALE:- similar to male, averaging somewhat larger and stouter. HEAD: wider than long, 1.19 (1.13-1.30): 0.86 (0.80-0.96); anteocular half averaging about half (49%) of anteocular width, 0.41 (0.40-0.43): 0.83 (0.76-1.00); antennals, I, 0.23 (0.23-0.26): II, 0.40 (0.36-0.44): III, 0.50 (0.46-0.60): IV, 0.67 (0.60-0.80): V, 0.87 (0.83-0.98); labials, 0.34 (0.33-0.36): II, 0.59 (0.54-0.66): III, 0.61 (0.60-0.66): IV, 0.43 (0.40-0.50). PRONOTUM: width more than twice length, 2.71 (2.34-3.13): 1.23 (1.04-1.36). SCUTELLUM: longer than wide, 2.14 (1.89-2.47): 1.72 (1.49-2.02). LENGTH of body, 5.23 (4.65-5.92).

TYPE DATA: Location of Palisot Beauvois' type unknown to author. Palisot Beauvois originally gave the type locality as "A Agathon, royaume

de Benin" in Africa. Stal (1864), after examining the type, wrote that the African locality was in error because this was the common American species described by Say as Cydnus ligatus. All authors - except Walker (1867) - have recognized and accepted Stal's correction. The type locality given in Say's original description was "United States." Say's private collection of insects, including whatever types may have been present, appears to have been completely destroyed. Fortunately, however, the T. W. Harris Collection, now housed in the Museum of Comparative Zoology at Harvard University, contains a number of specimens identified by Say for Harris. In reviewing the Hemiptera in that collection Uhler (1878:371) wrote,

> This collection is of especial interest at the present time, because it is the only one preserved in this country which contains original and authentic types of the Hemiptera described by Mr. Say.

He further noted (loc. cit.:372) that among the specimens of this species in the Harris Collection "No. 42" was named "Cydnus ligatus by Say himself for Dr. Harris." If this is not the specimen from which the original description was drawn, it may well serve as a neotype.

DISCUSSION: The original description and its accompanying illustration both call attention to the whitish lateral margins of the pronotum and corium. In addition, the illustration shows the elongate pale marks on the dorsal faces of the tibiae and shows the corium to be without the angled pale spot at the apex of the radial vein of the corium. Thus the name cinctus of Palisot Beauvois can apply only to the present form. Say's description of Cydnus ligatus is equally detailed in describing the pale markings that are present and in pointing out that the pale corial

maculations, other than the costal margin, are lacking. Thus his species also can apply only to this form and so must be considered a synonym of cinctus which was described twenty-six years earlier.

As is the case with subspecies albonotatus, the above-ground habits of this form have permitted observational access to parts of the life history of cinctus cinctus. The same general type of life history is evident, with overwintering adults (Hart 1919), possible breeding on labiates, and adults frequenting a variety of plants: sweet clover, Stachys sp., Monarda punctata (Hart 1919); raspberry (Froeschner 1941); raspberry, wild cherry and grasses (Blatchley 1926).

SPECIMENS STUDIED: 35 males, 54 females. UNITED STATES: Alabama: Barachias, Costopa, Gadsden; May-July. District of Columbia: April-June. Florida: Key Largo, Monticello, Tallulah; January, March, July. Georgia: Peach Co.; May. Iowa: Ames, Clarinda, Farragut, Gilbert, Iowa City, Muscatine, Shenandoah; March-August. Illinois: Algonquin, Belvidere, Cairo, Chicago, East Cape Girardeau, Glen Carbon, Havana, Peoria, Urbana; April-September. Kansas: Cowley Co., Douglas Co., Lawrence, Marion Co., Miami Co.; June-October. Kentucky: Henderson Co., Mason Co.; June-September. Louisiana: Baton Rouge; April-June. Maryland: Baltimore. Massachusetts: Boston. Michigan: Ann Arbor, Detroit, Livingston Co., Monroe Co., Oakland Co., Washtenaw Co.; May-August. Mississippi: Ag. Coll., Fontenot; June-August. Missouri: Aldrich, Barry Co., Glencoe, Hayti, "K.C.", Kinsey, Platte City, St. Louis, Sarcoxie, Wyatt; May-August. Nebraska: Grand Island; July. New Mexico: Ruidoso; June. New York: Geneva, Ithaca, Onandago Co., White Plains; April-June. North Carolina: Black Mts., Raleigh; March-July. Oklahoma: Quinton; June. Ohio: Columbus;

April, August. Pennsylvania: Jeanette, Philadelphia. South Carolina: Clemson; August. Tennessee: Clarksville, Knoxville, Lawrenceburg; April-August. Texas: Alpine, Austin, Brownsville, Cisco, College Station, Cowley, Dallas, Kerrville, Longview, Palm Grove, San Antonio, Sanderson; February-July. Virginia: Arlington, Charlottesville, Fairfax, Falls Church, Nelson Co., Shenandoah; April-August. Wisconsin: Broadhead; June. MEXICO: Distrito Federal: Chapultepec, Cuidad de Mexico, Lomastle; July. Guerrero: Rio Balsas. San Luis Potosi; Tamazunchale; June. Other Mexican localities: Tamps, San Jose; April. Real de Arriba Temescaltepec; July.

Sehirus cinctus texensis new subspecies

DIAGNOSIS: The creamy-white dot at the apex of the radial vein of the corium plus the shorter head (anteocular length less than half of anteocular width) will quickly separate this subspecies from the other two.

DESCRIPTION: MALE:- HEAD: wider than long, 1.14 (1.10-1.16): 0.87 (0.86-0.90); anteocular width little less than half of anteocular width, 0.34 (0.33-0.36): 0.75 (0.73-0.76); juga narrowly and lowly reflexed, punctured nearly or quite to edge; antennals, I, 0.23 (0.23-0.24): II, 0.38 (0.36-0.40): III, 0.47 (0.46-0.50): IV, 0.63 (0.63-0.66): V, 0.74 (0.73-0.76); labials, I, 0.31 (0.30-0.33): II, 0.56 (0.53-0.60): III, 0.50 (0.50-0.53): IV, 0.33 (0.33-0.36). PRONOTUM: width more than twice length, 2.47 (2.35-2.53): 1.10 (1.04-1.17). SCUTELLUM: longer than wide, 1.83 (1.75-1.89): 1.58 (1.49-1.62). LENGTH of body, 4.72 (4.35-4.95).

FEMALE:- similar to male, averaging somewhat larger. HEAD: wider than long, 1.26 (1.20-1.36): 0.93 (0.80-1.06); anteocular length averaging

less than half (45) of anteocular width, 0.40 (0.40-0.43): 0.88 (0.83-0.96); antennals, I, 0.25 (0.23-0.28): II, 0.40 (0.36-0.46): III, 0.47 (0.43-0.47): IV, 0.61 (0.56-0.66): V, 0.71 (0.70-0.76); labials, I, 0.38 (0.33-0.46): II, 0.61 (0.53-0.76): III, 0.61 (0.53-0.76): IV, 0.43 (0.36-0.50). PRONOTUM: width more than twice length, 2.90 (2.79-3.06): 1.26 (1.20-1.30). SCUTELLUM: longer than wide, 2.23 (2.08-2.40): 1.85 (1.75-1.95). LENGTH of body, 5.20 (4.95-5.70).

TYPE DATA: HOLOTYPE male, "Victoria, Tex., 12-16-15, J. D. Mitchell collector, hibernating in sedge grass," and ALLOTYPE female, "Victoria, Tx., V-19-07, J. D. Mitchell collector," both in the collection of the United States National Museum. PARATYPES: all are from Texas: Austin, VI-19-1930, 1m (RLU); same locality, IV-9-24, J. O. Martin Collector, 1f (CalAc). Brazoz Co., 2m, 5f (MCZ, RCF); same locality, V-2-50, Ray F. Smith collector, 2f (CIS). College Station, June 7, 1931, Mills, 1f. Concan, 7-6-36, D. R. Lindsay, 1m. Cypress Mills, Coll. Chittenden, 2f. Kerrville, V-27-07, J. D. Mitchell Collector, 1f. San Antonio, VI-42, E. S. Ross, 1f. Tiger Mills, 10-V, Schaupp, 13f. Uvalde, VI-12-30, G. Linsley Collector, 1f.

DISTRIBUTION: The specimens studied indicate that this subspecies occurs only in a very restricted part of the southeastern part of Texas bordered on the east by Brazos and Victoria counties and to the west by Kerr and Uvalde counties.

DISCUSSION: Although this form is treated here as a subspecies because of its limited range and great similarity to the more common form within whose range it occurs, there is some possibility that it may more properly be considered a full species. It is an established form which,

in spite of the very limited extent of its range, is sympatric with another form, cinctus cinctus. However, except for the color pattern of the corium, the two forms blend in a clinal series that at present defies morphological separation. Perhaps additional studies coupled with application of statistics will show them as sibling species. Before this can be done reliably, however, large series from several populations must be made available; too many of the specimens at hand for both this and related forms were single representations of collections.

SUBFAMILY GARSAURIINAE NEW SUBFAMILY

DIAGNOSIS: The fact that tarsal II is distinctly thinner than either I or III coupled with antennal II being much less than half as long as antennal I will set this subfamily apart from all others within the family. The trichobothrial arrangement (Fig. 174) and venational pattern in the hind wing (Fig. 169) are likewise each unique within the family.

DESCRIPTION: HEAD: length little more than half of width; antennae five-segmented; labium short, reaching base of mesosternum, II without semicircular foliaceous lobe. WINGS: three widely spaced veins leaving apex of radial cell, median vein with thick, wide, blunt process projecting into radial cell at midlength (Fig.169). SCUTELLUM: surpassing apices of clavi, latter not forming a commissure beyond apex of scutellum. THORACIC PLEURAE: (Fig. 88) posterior margins fully developed; propleuron with anterior and posterior convexities. LEGS: not especially modified; tarsi with segment II thinner than I or III; anterior tarsus inserted at apex of tibia. STERNITES: sutures faintly crenulate, curved anteriorly in middle third; sternites III to VII with two trichobothria arranged in horizontal rows posterior to the spiracles (Fig. 174).

TYPE OF SUBFAMILY: genus Garsauria Walker (1868:536), of which Microrhynchus Signoret (1882:lxiii), Microrrhamphus Bergroth (1891:214) and Brachyrrhamphus Haglund (1894:400) are all established synonyms.

DISTRIBUTION: Literature records show the range of this group to extend from the Malay Archipelago eastward across southern Asia into Africa.

DISCUSSION: At present, this subfamily consists of the single genus *Garsauria* Walker with the genotype *G. aradoides* fixed by the monobasic original proposal. In addition, there are four other species that have been proposed under this generic name. All of these are extra-limital to the present study and so will not be considered further here.

SUBFAMILY SCAPTOCORINAE NEW SUBFAMILY

DIAGNOSIS: The peculiar cultrate anterior tibia with the tarsus inserted at its midlength (Fig. 115) will separate this subfamily from all others in the Cydnidae.

DESCRIPTION: HEAD: subquadrate; lateral margins with oblique crenulations (Fig. 20); antennae four-segmented. SCUTELLUM: long, surpassing apices of clavi, latter not forming a commissure posterior to scutellar apex. WINGS: venation of posterior wings as in Fig. 165, Sc and R leaving radial cell at antero-apical angle, juncture of r-m and M basad of fracture in Sc+R, radial cell receiving short hamus from M. THORACIC PLEURAE: (Fig. 85) posterior margins not fully developed; propleuron with no posterior convexity; mesopleuron shrunken posteriorly, hind margin concave, exposing meso-metapleural membrane for most of its width; metapleuron shrunken posteriorly, reaching base of abdomen laterally thence inwardly curving anteriorly and partly exposing internal portion of posterior coxa. LEGS: strongly modified:- anterior tibia (Fig. 115) depressed, strongly cultrate, greatly projecting beyond tarsal insertion so that tarsus arises at its midlength, without a dorsal row of spines; middle leg (Fig. 133) obliquely impressed, dorsally distinctly curved, with rows of stout bristles, these absent on ventral face, tarsal insertion subapical; hind femora (Figs. 136 and 137) greatly swollen, hind tibia heavily club-shaped, apex obliquely truncated and surrounded by a row of stout denticles; tarsi present on front, middle and sometimes (Stibaropus) hind legs, segment II subequal in diameter to I and III. STERNITES: sutures strongly sinuate or

emarginate at level of ventral trichobothrium; sternites III-VII each with two trichobothria (Fig. 170), a small one posterior to spiracle and a much larger one antero-ventral to spiracle. TERMINALIA: male genital capsule (Fig. 178) opening posteriorly; female terminalia (Fig. 187) deflexed so that ventral plates are concealed by sternite VII.

TYPE OF SUBFAMILY: genus Scaptocoris Perty (1830:165).

DISTRIBUTION: The distribution of this subfamily is that of its two included genera, Scaptocoris and Stibaropus. Scaptocoris is restricted to the Neotropical Region where it is represented by not more than a half dozen known species; the similar number of species of Stibaropus appear confined chiefly to the Oriental Region with one species ranging westward through Asia Minor into southeastern Europe and so are extra-limital to this study.

DISCUSSION: In addition to the definitive characters given above the members of the Scaptocorinae have a unique facies due to the very strongly convex form. Of the above enumerated features the arrangement of the trichobothria, the shape of the sternal sutures, the venation of the hind wing and the elongated scutellum may be considered fundamental or of phylogenetic significance. These, plus the numerous other characters which are of a highly adaptive nature point to the group as a very specialized one. Together they emphasize that the evolutionary path followed by its members is separate and well removed from that travelled by other Cydnidae.

The biology of the Scaptocorinae is very poorly known, but what few facts are available will be treated under the species headings below.

Scaptocoris and Stibaropus, although so widely separated geographically, are very closely allied, causing one to be more impressed by their

similarities than their differences. But to separate the two is a relatively easy matter if one has recourse to the second labial; in Stibaropus it is simple, while in Scaptocoris it bears a strongly foliaceous, semicircular lobe which is often hidden between the anterior coxae.

Genus Scaptocoris Perty

1830 Scaptocoris Perty, Del. animal. artic., p. 165.

DIAGNOSIS: This genus, being the only member of its subfamily in the Western Hemisphere, may be recognized by any of the features mentioned in the subfamily treatment above. The peculiar club-shaped posterior tibiae offer the most-readily available means of identification.

DESCRIPTION: Short, compact, strongly convex dorsally and ventrally; widest posterior to midlength of body. HEAD: (Figs. 20 and 51) little wider than long, anterior two-thirds strongly declivent; margin of jugum crenulate with a series of oblique, overlapping crenulations with a single cilium between, without a submarginal row of spines or cilia; eyes prominent, strongly projecting; ocelli well developed, situated behind a line connecting posterior margins of eyes; clypeus as long as or longer than paraclypei; antennae four-segmented, IV thickest; bucculae vestigial or absent, maxillary plate with a tuft of long cilia near their site; labium short, arising posterior to apex of head, not or only slightly surpassing anterior coxae, II thickest, with a large, foliaceous, semicircular lobe which is often hidden between anterior coxae. PRONOTUM: distinctly broader than long, narrowed anteriorly, all angles and lateral margins broadly rounded; lateral margins carinate, strongly deflexed with a submarginal row of twelve to twenty setigerous punctures; transverse impression weak

or absent; posterior lobe longer than anterior lobe and with wide, transverse rugae which are sometimes punctured. SCUTELLUM: longer than broad; sculptured similarly to posterior lobe of pronotum; apex expanded, broadly rounded, wider than half of membranal suture. HEMELYTRON: corial areas usually well-defined; membranal suture distinctly sinuate on medial half; membrane hyaline to slightly milky, not more than two-fifths of hemelytral length, usually distinctly surpassing apex of abdomen. PROPLEURON: strongly convex anterior to depression, impunctate; prosternal carinae low, broad, bluntly rounded and projecting anterior margin of prosternum as a broad, short, lobe, MESOPLEURON: slightly convex, impunctate; evaporatorium restricted to posterior part of segment; mesosternum carinate medially, with numerous long hairs. METAPLEURON: slightly convex, impunctate; osteole opening posteriorly under reduced peritreme surrounded by extensive evaporatorium. LEGS: short and stout; anterior femora stout, thick, height about one-half length; anterior tibiae strongly depressed, prolonged beyond tarsal insertion by more than one-third its length; tarsi very slender, length more than half of tibia, II shortest, subequal in diameter to I and III; middle femora not much swollen; middle tibiae somewhat clavate, curved, ciliate, slightly projecting beyond tarsal insertion; length of middle tarsus about one-third of tibia; posterior femora very strongly swollen, convex dorsally; posterior tibiae stoutly club-shaped, apex obliquely truncated, with U-shaped corbicle; tarsi absent[1]. STERNITES: strongly convex, densely,

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[1]In the original description Perty wrote of the hind tarsi, "tarsis nullis," but in error showed them as present in the illustration. Blanchard (1840) pointed out the error in the figure. Signoret (1881b) objected to considering the posterior tarsi absent and wrote of them as being present and "tres petits, insertes a l'extremite superieure de la troncature." Champion (1900) reported that he was unable to find tarsi on any of the specimens before him. The present study found all pits and punctures of the hind tibiae occupied by short, decumbent spines, and that no point for tarsal attachment exists. Thus, there appears to be no reason to disagree with the original statement, "tarsis nullis" as Signoret has done.

long-haired subapically. TERMINALIA: see subfamily treatment. COLOR: all species are some shade of tan or brown; no piceous or black forms are known.

The single nymph available during this study was a third instar of talpa. It showed the head and leg structure of the adults and indicated that the nymphs of this genus may be readily recognized by these same peculiar modifications.

GENOTYPE: Scaptocoris castaneus Perty (1830:166), monobasic.

DISTRIBUTION: This genus is restricted to the Neotropical Region where it has been reported as far north as Mexico and Cuba and south on the South American continent to northern Argentina.

DISCUSSION: The few notes that have been published on the biology of the species of this genus indicate they are root feeders as adults and nymphs (Champion 1900, Carvalho 1952) and of some agricultural importance (Champion 1900, Costa Lima 1940).

In 1849 Schiodte also described as new in this genus the three species callidus (p. 460), molginus (p. 458) and tabulatus (p. 459). All of these have been properly transferred to Stibaropus.

Key to the Known Species of Scaptocoris

1. Corbicle of posterior tibia crowded with numerous coarse, transverse tubercles arranged in rows which extend almost to base of tibia (Fig. 136) . . . . . .giselleae Carvalho p. 56

   Corbicle of posterior tibia mostly smooth, with few tubercles (Fig. 134) 2

2. Clypeus distinctly surpassing apices of juga and broadly expanded anterior to them (Fig. 51). . . . . castaneus Perty p. 53

Clypeus not or only slightly surpassing juga, not distinctly expanded anterior to them 3

3. Eyes broadly transverse, width of one of them equal to or greater than a third of interocular width; pronotum with distinct punctures on and in transverse sculpturing . . . . minor Berg p. 58

Eyes not so broad, width of one of them less than a third of interocular width; pronotum with or without punctures 4

4. Corbicle with discal tubercles in an irregular, single row very close to and paralleling outer edge of corbicle (Fig. 134); pronotal rugae distinctly punctured . . . . . talpa Champ. p. 61

Corbicle with discal tubercles not in an irregular row close to outer edge of corbicle (Fig. 135); pronotal rugae impunctate or feebly punctate. 5

5. Size larger, length of body 10.1 mm.; color dark reddish-brown . . . . . grossa n.sp. p. 59

Size smaller, length of body 5.1-7.2 mm.; color yellowish-tan . . . . . terginus Schiodte p. 62

Scaptocoris castaneus Perty (Fig. 3)

1833 Scaptocoris castanea Perty, Delect. Anim. Artic., p. 166, pl. 33, fig. 5.

1843 Scaptocoris castaneus Amyot and Serville, Hist. Nat. Ins., Hemip., p. 95.

1851 Scaptocoris castaneus Dallas, List Hemip. Brit. Mus., 1:124.

1876 Scaptocoris castaneus Stal, Svenska Vet.-Ak. Handl., 14(4): 17.

1881 Scaptocoris castaneus Signoret, Ann. Soc. Ent. France, (6) 1:41, pl. 2, fig. 50.

1884 Scaptocoris terginus Berg, Add. Emend. Hemip. Argentina, p. 11 (part)

1886 Scaptocoris terginus Uhler, Check List Hemip. N. Am., p. 3.

1893 Scaptocoris castaneus Lethierry and Severin, Gen. Catal. Hemip.,1:60.

1914 Scaptocoris terginus Torre Bueno, Ann. Mus. Nac. Buenos Aires, 26:162. (part)

1932 Scaptocoris terginus Barber and Bruner, Jour. Dept. Agr. Peurto Rico, 16:235.

1939 Scaptocoris terginus Martorell, Jour. Agr. Univ. Peurto Rico, 29:186.

DIAGNOSIS: The prolonged and strongly expanded clypeus (Fig. 51) will separate this species from others in the genus.

DESCRIPTION: MALE:- (based on two specimens) HEAD: (Fig. 51) wider than long, 1.61 (1.60-1.63): 1.50 (1.49-1.51); interocular width, 1.04 (1.03-1.06); ocellus large, separated from eye by less than transverse ocellar width; juga weakly convex, shorter than clypeus, latter diverging from base, very wide at apex; antennals, I, 0.59 (0.58-0.61): II, 0.48 (0.46-0.50): III, 0.43 (0.43-0.43): IV, 0.54 (0.53-0.56); labials, I, 0.53 (0.53-0.54): II, 0.52 (0.50-0.55): III, 0.43 (0.42-0.44): IV, 0.37 (0.36-0.38). PRONOTUM: length about three-fifths width, 2.64 (2.63-2.66): 4.33 (4.30-4.36); posterior lobe impunctate. SCUTELLUM: longer than wide, 3.43 (3.42-3.45): 2.67 (2.65-2.69); impunctate. HEMELYTRON: polished, obsoletely or not punctate. LEGS: corbicle of posterior tibia with single, submedian row of tubercles on dorsal half. TERMINALIA: gonostylus as illustrated (Fig. 189). COLOR: yellow brown, apices of anterior tibiae and sometimes marginal spines of corbicles of posterior tibiae fuscous or black. LENGTH of body, 7.47 (7.44-7.50).

FEMALE:- very similar to male. HEAD: width: length:: 1.65 (1.58-1.72): 1.49 (1.40-1.60); interocular width, 1.11 (1.00-1.16); antennals, I, 0.66

(0.60-0.73): II, 0.50 (0.46-0.55): III, 0.49 (0.43-0.56): IV, 0.59 (0.56-0.60); labials, I, 0.53 (0.46-0.60): II, 0.57 (0.50-0.63): III, 0.40 (0.34-0.43): IV, 0.36 (0.33-0.43). PRONOTUM: length: width:: 2.72 (2.55-2.92): 4.54 (4.25-4.80). SCUTELLUM: length: width:: 3.54 (3.15-3.90): 2.92 (2.85-3.07). LENGTH of body, 7.68 (7.05-8.25).

TYPE DATA. Location of type unknown to author. The original type locality was listed, "Habitat in Provincia Piauhiensis, " Brazil, by Perty (loc. cit.).

DISTRIBUTION: Specimens studied indicate that the range of this species extends from Panama to northern South America and some of the adjacent islands: Colombia and Venezuela on the continent and Trinidad just off the shore of the latter.

DISCUSSION: There is some doubt about the proper application of this name to the present species. Perty's description and figure were excellent for assignment to genus but are insufficient to decide which of the six species should bear the trivial name. The present, well-marked species was assigned this name by Signoret even though none of his specimens were from Brazil. Although Signoret's conclusions have been questioned by some authors, his assignment is being followed here for two reasons: 1) since the name has been carried by this species for some time and no one has presented contradictory information from the type specimen there appears to be no gain by changing it; 2) a statement in the original description, "Clypeus elongatus, antice rotundatus," is more suggestive of this species than of the others. Surely the reference to an elongated clypeus must refer to the tylus which in this form distinctly surpasses the adjacent juga; and the fact that it is rounded apically beyond the outline of the

head might be construed as reason for the additional comment. Thus, there really appears to be no good reason for a name-change at this time.

Costa Lima (1940) reported castaneus as being of agricultural importance in Brazil. Since castaneus is the only species now known to occur as far north as Cuba, Martorell's (1939:186) notes on terginus on that island probably belong to it. These notes include several interesting biological facts on the species and are quoted below:

> This insect becomes a real menace during the rainy nights at La Providence. It is the favorite food of the toad, Bufo marinus L., during the season. About 90% of the stomach contents of toads, during the time that these insects were abundant, consists of S. terginus, according to dissections made by the writer. The toads do not seem to mind the repugnant odor of these bugs. During the first hours of the evening, when the bright lights inside of the School of Agriculture were turned on, these insects would come in great numbers, attracted to the lights.

SPECIMENS STUDIED: 2 males, 22 females. PANAMA CANAL ZONE: Ft. Clayton, VI-25-45, K. E. Frick, 1f (CalAc). Madden Dam, V-18-36, M. M. Saylor, 2 f (RLU). COLUMBIA: Rio Frio, 5-26-25, 6f (USNM); same locality, V-20-30 '28, Darlington f (MCZ). VENEZUELA: Boqueron, Yaracuy, March 20, 1920, J. & E. B. Williamson, 2f (MMZ). Caracas Valley, Los Ruisses, May 1926, H. E. Box, 11f (BrM). LaFria, Tachira, April 19, 1920, J. & E. B. Williamson, 2m (MMZ).

Scaptocoris giselleae Carvalho

1952 Scaptocoris giselleae Carvalho, Bol. Mus. Nacional, No. 110: 1, ills.

DIAGNOSIS: The presence of numerous rows of close-set tubercles which fill the corbicle and extend irregularly to the base of the posterior tibia will easily separate this species from all others in the genus.

DESCRIPTION: (based on one female) FEMALE:- LENGTH of body, 8.40.

HEAD: wider than long, 1.75:1.63; interocular width, 1.33; width of eye, 0.21; ocellus small, separated from eye by a space one-and-a-half times ocellar width; juga weakly convex, almost as long as tylus, latter diverging slightly from base to apex; antennals, I, 0.60: II, 0.63: III, 0.43: IV, 0.60; labials, I, 0.60: II, 0.66: III, 0.46: IV, 0.38. PRONOTUM: length: width:: 2.70:4.65; posterior lobe with numerous, scattered, fine fuscous punctures. SCUTELLUM: length: width:: 3.81: 3.15; with a few fine punctures toward sides similar to pronotum. HEMELYTRON: polished, with scattered fine punctures, those of exocorium colored like those on pronotum; membrane yellowed, very short, reaching almost to apex of penultimate tergite. LEGS: posterior tibiae with corbicle and dorsal surface crowded with rows of close-set tubercles, as in Fig. 136. COLOR: light brown, apices of anterior tibiae slightly darker.

TYPE DATA: In collection of the National Museum, Rio de Janeiro, vide Carvalho (loc. cit.). That author listed the type locality as "Sernambetiba, D. Federal, Brazil."

DISTRIBUTION: So far, this recently described species is known only from southern Brazil in the general latitude of Rio de Janeiro.

DISCUSSION: Giselleae is quite distinct within the genus on several characters: 1) the numerous tubercles on the hind tibia; 2) the very short wing membrane which falls short of the apex of the abdomen; and 3) the small ocelli which are separated from the nearest eye by a space distinctly more than the transverse diameter of an ocellus.

With his original description of this species Carvalho (loc. cit.) reported that the type material was collected on July 7, 1951

> . . . by Miss Giselle Machline who collected them when digging between a type of vegetation dominated by Diplothemium maritimum Martuis, a dwarf palm and a prairie type of vegetation. There were collected altogether 15 specimens in different phases of development, about one hundred meters from the tide line and two meters below the surface of the soil. The bugs were probably feeding on the roots of Telanthera maritima Moq. since they were found around a gall of about the size of a human wrist. A strong odor was noted when handling them.

SPECIMENS STUDIED. 1 female. BRAZIL: Sao Paulo, from A. A. Barbiellini, lf (USNM).

Scaptocoris minor Berg

1894 Scaptocoris minor Berg, An. Mus. Montevideo, 1:14.

DIAGNOSIS: MALE:- HEAD: wider than long, 1.67 (1.63-1.72): 1.37 (1.33-1.43); interocular width, 0.96 (0.86-1.00); width of eye, 0.36 (0.34-0.38); ocellus large, separated from eye by less than ocellar width; clypeus narrow, parallel-sided, reaching or slightly surpassing apices of juga; antennals, I, 0.40 (0.40-0.43): II, 0.42 (0.40-0.46): III, 0.43 (0.40-0.50): IV, 0.62 (0.60-0.66); labials, I, 0.49 (0.46-0.56): II, 0.56 (0.53-0.63): III, 0.36 (0.33-0.40): IV, 0.35 (0.33-0.36). PRONOTUM: length: width:: 2.39 (2.10-2.63): 3.97 (3.63-4.20); transverse rugae distinctly punctured. SCUTELLUM: length: width:: 3.28 (3.11-3.43): 2.50 (2.25-2.75); surface more or less distinctly punctured. HEMELYTRON: corium polished, with numerous fine to moderate punctures; membrane surpassing apex of abdomen by more than half its length. LEGS: corbicle of hind tibia with a double, irregular row of tubercles on outer half. TERMINALIA: gonostylus as illustrated (Fig. 190). COLOR: light brown to brown, apices of anterior tibiae and marginal tubercles of corbicle of posterior tibiae fuscous to black. LENGTH of body, 6.79 (6.00-7.42).

FEMALE:- very similar to male, measurements more variable. HEAD: width: length:: 1.65 (1.54-1.86): 1.39 (1.30-1.50); interocular width, 0.94 (0.86-1.03); width of eye, 0.36 (0.32-0.41); antennals, I, 0.36 (0.33-0.43): II, 0.42 (0.34-0.53): III, 0.40 (0.36-0.50): IV, 0.59 (0.53-0.66); labials, I, 0.48 (0.40-0.56): II, 0.55 (0.45-0.63): III, 0.36 (0.36-0.40); IV, 0.30 (0.28-0.33). PRONOTUM: length: width: : 3.26 (2.84-3.70): 2.35 (2.05-2.73). LENGTH of body, 6.50 (5.40-7.56).

TYPE DATA: Type in Museo Argentina de Ciencias Naturales (formerly Museo Nacional de Buenos Aires) in Buenos Aires, Argentina, vide Kormilev (1953). Because the publication containing the original description was not available during this study, the data from the type specimen are given as kindly furnished by Kormilev (loc. cit.) from the type - "Matto Grosso, Brazil."

DISTRIBUTION: Data on specimens at hand indicated that the range of this species extends across central South America from Peru to Brazil.

DISCUSSION: No comments are warranted at this time.

SPECIMENS STUDIED: 10 males, 21 females. BRAZIL: Amazon River, Arary to Manaos, 9, 20-21, 30, Holt, Blake and Agostini. 1m (USNM); Parintins, August 1935, G. V. Vredenburg. 2m, 4f (BrM); Bahia, Dec. 6, 1907. 1m, 4f (Car); Taperapes, Aracuayes, Mato Grosso, Carvalho. 2f (CMC); Amazonas. PERU: Peurto Maldanado, Madre de Dios, April 17, 1947, Alt. 600 ft., J. C. Pallister, 6m, 8f (AM). VENEZUELA: Exp. Terr. Amazonas, Samariapo, June 12, 1950, J. Maldanado Capriles, 1f (Cap).

Scaptocoris grossa new species

DIAGNOSIS: The large size and impunctate posterior lobe of the pronotum mark this new species from its congenitors.

DESCRIPTION: (based on four females, one too badly eaten by dermestids to yield measurements) FEMALE:- HEAD: wider than long, 2.39 (2.30-2.47): 2.06 (2.02-2.08); interocular width, 1.52 (1.46-1.56); width of eye, 0.43 (0.42-0.49); ocellus large, separated from eye by less than an ocellar width; clypeus parallel-sided, subequal to length of juga; antennals, I, 0.73 (0.70-0.73): II, 0.82 (0.80-0.83): III, IV and V missing in all specimens seen; labials, I, 0.71 (0.70-0.73): II, 0.85 (0.83-0.88): III, 0.57 (0.56-0.60): IV, 0.54 (0.53-0.56). PRONOTUM: length: width:: 3.85 (3.75-3.94): 6.22 (6.15-6.31); posterior lobe impunctate. SCUTELLUM: length: width;: 4.72 (4.65-4.80): 3.99 (3.90-4.05); impunctate. HEMELYTRON: polished, virtually impunctate or with obsolete punctures; membrane hyaline, surpassing apex of abdomen by about one-third its length. LEGS: corbicle of posterior tibia with discal tubercles few in number, well removed from outer margin. COLOR: dark brown, apical half or more of anterior tibiae and marginal tubercles of corbicle of posterior tibiae black. LENGTH of body, 10.65 (in all specimens).

TYPE DATA: HOLOTYPE female, "Peru, S. A., 4-21, 1930, F. Woytkowski, NO.398, Dept. Huanuco, Loc. Shapajilla, 630 m. a. s., 1.11 km. N. E. Tingo Moria," in The Entomological Museum, University of Kansas. PARATYPES: same data as type, 2f (RCF, USNM). Yungas de Coroico, Bolivia, Fassel, 1f (Wien Mus).

DISTRIBUTION: This species is known only from Bolivia and Peru as indicated above.

DISCUSSION: Although known only from a few female specimens, the present species must be erected because the specimens agree with none of the previously described forms. The four specimens were very uniform in

appearance and stood out more boldly in general habitus than was borne out by structural features. In its large size and dark color it appears superficially most like talpa, but the impunctate posterior lobe of the pronotum and the irregularly-placed discal tubercles of the corbicle that are distinctly removed from the side of the corbicle will separate it effectively from talpa.

Scaptocoris talpa Champion

1900 Scaptocoris talpa Champion, Ent. Month. Mag., 36:256.

DIAGNOSIS: The location of the single row of transverse tubercles very close to the outer edge of the corbicular area of the hind tibia (Fig. 134) separates this species readily from all others in the genus.

DESCRIPTION: MALE:- (two specimens) HEAD: wider than long, 1.94 (1.93-1.95): 1.65 (1.62-1.69); interocular width, 1.31 (1.30-1.33); width of eye, 0.32 (in both specimens); ocellus large, separated from eye by less than ocellar width; clypeus subparallel-sided, subequal to length of juga; antennals, I: 0.70 (0.70-0.70): II, 0.65 (0.65-0.66): III, 0.47 (0.45-0.50): IV, 0.66 (0.66-0.66); labials, I, 0.65 (0.65-0.66): II, 0.68 (0.66-0.70): III, 0.44 (0.43-0.46): IV, 0.40 (0.38-0.42). PRONOTUM: length: width:: 3.18 (3.15-3.22): 5.17 (5.10-5.25); posterior lobe with distinct, fine punctures; membrane surpassing apex of abdomen by about one-third its length. LEGS: discal tubercles of hind tibial corbicle arranged in a single, irregular row very close to outer margin of corbicle (Fig. 134). TERMINALIA: gonostylus as illustrated (Fig. 191). COLOR: light brown, apices of anterior tibiae and marginal and discal tubercles of corbicle of posterior tibiae fuscous to black. LENGTH of body, 8.57 (8.55-8.60).

FEMALE:- (three specimens) very similar to male, measurements somewhat larger. HEAD: width: length:: 2.05 (2.02-2.06): 1.79 (1.72-1.85); interocular width, 1.37 (1.36-1.40); width of eye, 0.32 (0.32-0.33); antennals, I, 0.75 (0.73-0.76): II, 0.69 (0.66-0.73): III, 0.51 (0.50-0.53): IV, 0.71 (0.70-0.73); labials, I, 0.66 (0.60-0.70): II, 0.74 (0.70-0.76): III, 0.46 (0.43-0.50): IV, 0.41 (0.40-0.43). PRONOTUM: length: width:: 3.43 (3.22-3.75): 5.47(5.25-5.83). SCUTELLUM: length: width:: 4.07 (4.00-4.14): 3.23 (3.07-3.48). LENGTH of body, 9.33 (9.00-9.60).

TYPE DATA: The type series of "many specimens," including nymphs as well as adults, was originally recorded by Champion (loc. cit.: 257) as coming from "Guatemala, Capetillo." Some of these specimens are probably still in the British Museum of Natural History in London, England.

DISTRIBUTION: All available data, both published and on specimens, indicate that this species occurs only in Guatemala. Surely additional collecting in Central and possibly northern South America will show this insect to have a wider range.

Accompanying the original description Champion (loc. cit.:255) reported that the types had "been found underground, at the roots of sugar cane and other plants."

SPECIMENS STUDIED: 2 males, 4 females, 1 nymph. GUATEMALA: West Coast, Nov. 20, '28, Dr. V. C. Dunlap. 1m, 4f, 1n (USNM); J. G. Salas, on sugar cane. 1m (USNM).

Scaptocoris terginus Schiodte

1849 Scaptocoris terginus Schiodte, Nat. Tidsk., (2) 2:460.

1876 "Scaptocoris ? terginus" Stal, Svenska Vet.-Ak. Handl., 14(4):17.

1881 Scaptocoris terginus Signoret, Ann. Soc. Ent. France, (6) 1:42, pl. 1, fig. 3. (part).

1884 Scaptocoris terginus Berg, Add. Emend. Hemip. Argentina, p. 11 (part).

1893 Scaptocoris terginus Lethierry and Severin, Gen. Catal. Hemip., 1:60.

1893 Scaptocoris castaneus Lethierry and Severin, Gen. Catal. Hemip., 1:60.

1914 Scaptocoris terginus Torre Bueno, Ann. Mus. Nac. Buenos Aires, 16: 162 (part).

DIAGNOSIS: The small size and lack of distinct punctures on the posterior lobe of the pronotum will separate this species from the others in the genus.

DESCRIPTION: MALE (on two specimens):- HEAD: wider than long, 1.51 (1.40-1.63): 1.36 (1.33-1.40); interocular width, 1.05 (0.96-1.14); ocellus large, separated from eye by less than an ocellar width; clypeus narrow, parallel-sided, reaching or slightly surpassing apices of juga; antennals, I, 0.48 (0.43-0.53): II, 0.51 (0.50-0.53), III, 0.43 (0.43-??): IV, 0.60 (0.60-??); labials, I, 0.50 (0.50-0.50): II, 0.56 (0.53-0.60): III, 0.39 (0.36-0.43): IV, 0.36 (0.36-0.36). PRONOTUM: length: width:: 2.65 (2.46-2.85): 4.39 (4.11-4.57); transverse rugae impunctate or very feebly punctured. HEMELYTRON: corium polished, with scattered fine, weak punctures; membrane surpassing apex of abdomen by about one-half its length. LEGS: corbicle of hind tibia with a double, irregular row of transverse tubercles on the outer half but well separated from edge of corbicle. TERMINALIA: gonostylus as illustrated (Fig. 192). COLOR: yellowish-brown, apices of anterior tarsi and marginal teeth of corbicle darker brown to blackish. LENGTH of body, 7.12 (6.75-7.50).

FEMALE:- very similar to male, measurements more variable, averaging larger. HEAD: width; length:: 1.64 (1.44-1.73): 1.36 (1.16-1.46); inter-

ocular width, 1.09 (0.93-1.20); width of eye, 0.27 (0.25-0.29); antennals, I, 0.46 (0.43-0.50): II, 0.54 (0.50-0.58): III, 0.43 (0.43-0.43): IV, 0.58 (0.56-0.63); labials, I, 0.56 (0.53-0.60): II, 0.59 (0.50-0.66): III, 0.39 (0.36-0.43): IV, 0.58 (0.56-0.63). PRONOTUM: length: width:: 2.75 (2.31-3.00): 4.60 (3.78-4.78). SCUTELLUM: length: width:: 3.43 (3.22-3.79): 2.85 (2.43-3.15). LENGTH of body, 7.37 (6.45-7.80).

TYPE DATA: Location of type unknown to Author. Schiodte (loc. cit.: 460) gave the original locality as "Brazil."

DISTRIBUTION: The material available indicated that this species is restricted to southern South America as all specimens assignable to it were from Argentina. The literature records for Cuba, Trinidad and Venezuela are certainly questionable and in the present paper have been transferred to castaneus.

DISCUSSION: Costa Lima (1940) reported this species as damaging tomatoes and pimentoes in Argentina.

SPECIMENS STUDIED: 2 males, 5 females. ARGENTINA: La Rioja Prov., Patquia, K. J. Hayward, B. M. 1933-333, 1m, 1f (BrM). Mendoza, 1f (MCZ). Perico to Embarcion, 19.V.'20, G. I. Harrington, 1f (USNM). Yucuman, 450 M, Collection Rosenberg, 1m, 2f (USNM).

SUBFAMILY CYDNINAE BILLBERG

1820 Cydnides Billberg, Enum. Ins. Mus. Billberg, p. 70.

DIAGNOSIS: Technically, members of this subfamily may be recognized by the arrangement of the trichobothria (see discussion of subfamilies on page 22) or the venation of the metathoracic wing (shape of radial cell plus absence of hamus, see page 23). More readily available means of determination, however, have been pointed out in the key to subfamilies. Several of these features must be used together: lack of claval commissure, front tarsus arising at apex of tibia and the presence of a lateral, submarginal row of setigerous punctures on the pronotum.

DESCRIPTION: HEAD: margin entire, not crenulate; antennae four- or five-segmented. SCUTELLUM: long, surpassing apices of clavi, latter not forming commissure posterior to scutellar apex. THORACIC PLEURAE: posterior margins all well developed, propleuron with strong convexity posterior to depression; mesopleuron with posterior margin touching or overlapping metapleuron for most or all of its width; metapleuron with posterior margin reaching to base of abdomen for its full width and completely covering internal part of hind coxa. LEGS: weakly or strongly modified: anterior tibia of all strongly compressed, a row of stout spines dorsally; middle legs feebly or not modified; posterior legs variously terete or compressed, straight, curved or sinuate, rows of spines regularly spaced or crowded on dorsal and ventral margins; tarsi present on all legs, segment II shortest, subequal in diameter to I and III. STERNITES: sutures nearly straight, not strongly sinuate laterally; trichobothria arranged differently on each

segment; on VII arranged in transverse row behind spiracle, on VI to III successively the ventral trichobothrium shifts farther forward until on III it lies mesad or meso-anteriorly to the spiracle (Fig. 172). TERMINALIA: male genital capsule opening dorsally; female plates well-developed, mostly exposed (Fig. 186).

TYPE OF SUBFAMILY: Genus Cydnus Fabricius (1803:184).

DISTRIBUTION: Available information showed that the full geographic range of the family--world wide, in all zoogeographic regions--is occupied by members of this subfamily.

DISCUSSION: The present subfamily not only contains more genera and species than do all of the other subfamilies combined but appears also to show greater contrast extremes of morphological modifications. On the basis of the wing venation, trichobothrial arrangement and the head structure the Cydninae appear to be more closely related to the Sehirinae and the Garsauriinae than to the Scaptocorinae and Amnestinae.

A complete life cycle of one or more species of the Cydninae is a great desideratum. Although only scattered, fragmentary biological notes are available, the probable outline of a life history suggested in discussion of the family in this paper (page 21) should be found true, even if very incomplete.

The separation and definition of the many included genera has been difficult, and even yet may be considered far from complete. The search for characters that would permit concise, clear-cut definitions of genera has been only partially successful. The relative value given to any set of characters may vary with workers, so that the included, conservative number of genera may be greatly increased by those who see fit to assign higher

taxonomic worth to some of the features here relegated to a position below a genus. In a family as poorly known and as uniform as this one appears to be, any marked structural feature presents a great temptation to the worker to establish a genus--regardless of whether or not the modification has any fundamental value. This type of splitting results in numerous monotypic genera which may be based on secondary sexual characters, adaptive modifications or even "ornamental" features of a single species. The present author considers that several monotypic genera of the Western Hemisphere fall in this category and must be suppressed, they are Colobophrys Horvath, Pachymeroides Signoret, Psectrocephalus VanDuzee and Stenocoris Signoret (nec Rambur, see Dallasiellus Berg in this paper). These are reduced to subgenera or full synonyms in the text where full explanations are also given. All of these were based on a single superficial but prominent character. They all remained monotypic.

One of the most important and useful characters, as previously used first by Uhler (1877) and later to a lesser extent by Signoret (1881 to 1884), is the modification of the osteole and its peritreme. These features will permit the arrangement of the genera of the world into two groups which, for convenience and to avoid any suggestion of a nomenclatorial position, will be referred to as Groups A and B.

Group A can be defined as including those genera which show a definitely differentiated terminal structure on the anterior part of the osteolar peritreme (Figs. 89-100), the differentiation being due either to definite widening of the terminal part, or to a marked difference in texture (i.e., being very shining, polished) or a combination of both. The position of the actual osteolar opening, whether visible ventrally at

the base of the terminal lobe or opening posteriorly (not visible ventrally) on the peritreme, also shows some significance.

Group B would include those genera which do not show any such terminal modification on the anterior part of the peritreme (Figs. 102-112). In addition, all members of this group have the osteole opening posteriorly on the peritreme so that it is not visible ventrally.

The separation of the genera in each of these two groups must be separated on an entirely different set of characters. In Group A the modifications of the terminal lobe of the peritreme furnish abundant generic separations. One section of the group exhibits a short, expanded lobe of various shapes and textures (Figs. 90, 95-100); a second section has the terminal modification markedly transversely elongate and with or without a recurved apical part (Fig. 89, 91-94). In each section there appear some additional modifications which aid in further separation of the genera so that only very few of the features shown by other body parts are required for delimiting the genera within Group A.

Group B is characterized by the lack of terminal modifications of the peritreme (Figs. 102-112). Therefore characters derived from other parts of the body must be used for separating the included genera. Several usable and apparently significant features may be used to separate most of these genera, but at the end of the series there accumulates a very heterogeneous mass of species for which the author has been unable to find satisfactory separation. At the present stage of study he has accepted an admittedly very weak feature to separate this unwieldy mass into two groups for which generic names are already available. These two genera, Dallasiellus Berg and Tominotus Mulsant and Rey, each include species which appear to be

closer to certain of those in the other genus than to some of the more remote members of the same genus. This condition has led the author to hunt for additional breaks, but he has not found any that satisfy him any better.

The author has been deliberately conservative in accepting genera in both groups. He believes that numerous genera of but one or a few species emphasizes the differences between species rather than their relationships. This has led him to define genera by groups of characters possessed in common rather than by single differences. The results of such an approach may be very unsatisfactory to those who hold the opposite view, so an effort was made to compromise the two view points by retaining some of the lesser differences to establish subgenera. Thus the relationships as well as the more conspicuous structural modifications may be recognized.

The following table to the genera of the Cydnidae occurring in the New World indicates the author's current conclusions:

A. Anterior part of osteolar peritreme terminated by a differentiated lobe, loop or band (Figs. 89-101); osteolar opening usually visible ventrally at base of terminal process.

B. Terminal process of peritreme elongate, transverse length more than three times width (Figs. 91-94).

C. Terminal process fused with cuticula, forming a flat, polished band extending to lateral margin of evaporatorium and separated therefrom by a distinct, impressed line (Figs. 92-94). Rhytidoporus

CC. Terminal process a narrow, shallow trough with extreme apex convex and recurved (Fig. 91) Macroporus

BB. Terminal process short, transverse length not more than twice width.

D. Metapleural evaporatorium limited, simply outlining peritreme (Fig. 90). Microporus

DD. Metapleural evaporatorium extensive, occupying most of segment (Figs. 95-97).

E. Terminal process large, elongate oval, with one to three longitudinal rugae discally (Fig. 89). Cydnus

EE. Terminal process not elongate oval, without rugae (Figs. 95-97, 101). Ectinopus
Melanaethus
Onalips

AA. Anterior part of osteolar peritreme not differentiated terminally (Figs. 102-112), posterior part sometimes with spine- or tongue-like process; osteole opening posteriorly on peritreme, not visible ventrally.

F. Pronotum with a sharply defined, deeply impressed transverse line paralleling anterior margin from side to side (Fig. 14 and 73). Pangaeus
Homaloporus

FF. Pronotum without such a line.

G. Posterior tibia strongly compressed, spines confined to dorsal and ventral margins, ventral spines longer, thinner and more tapering than those of dorsal margin (Figs. 141 and 142).

H. Labial II with a semicircular foliaceous lobe (Fig. 36). Prolobodes

HH. Labial II without such a lobe (Fig. 34). Cyrtomenus

GG. Posterior tibia not compressed, spines rather uniformly developed on all margins (Figs. 140, 148-150). Dallasiellus

Tominotus

In the above arrangement, two points are worthy of mention. First, the two genera listed under GG represent those which were stated above to be very difficult to separate fully and satisfactorily. As mentioned above, this is a "residual area" of negative characters that includes a number of species groups. But whether these groups are worthy of generic, subgeneric or even lower standing is not yet evident. For convenience they are held thus. Supporting evidence will be found in the generic discussions of them.

The second note-worthy point is the absence of certain familiar generic names like Aethus, Geocnethus and Geotomus. These three genera have Old World genotypes and none of our forms are congeneric with them. In general, our species formerly assigned to Aethus belong to Tominotus; those listed as Geocnethus go to Dallasiellus; and the name Melanaethus replaces Geotomus in the Western Hemisphere. These name changes are discussed under the appropriate generic discussions. With these and certain other generic redefinitions resulting from a companion study on the Old World forms, each genus now assumes a zoogeographic significance that it formerly lacked.

Key to the Genera of Cydnidae Known to Occur in the Western Hemisphere

1. Anterior part of osteolar peritreme modified apically into a distinctly differentiated loop, lobe or band which is wider than basal part of peritreme and more or less polished

(Figs. 89-101) 2

Anterior part of osteolar peritreme without enlarged, differentiated apical structure, sometimes with a small, subapical, posterior hook- or flap-like projection (Figs. 102-112). 8

2. Osteolar peritreme with apical process elongate, transverse length three or more times width (Figs. 91-94) 3

Osteolar peritreme with apical process short, transverse length not more than two times width 4

3. Osteolar peritreme an elevated, trough extending almost to lateral margin of segment where it forms a recurved, polished lobe (Fig. 91) . . . . . Macroporus Uhl. p. 91

Osteolar peritreme a transverse polished band, neither elevated, trough-like nor recurved apically (Figs. 92-94). . . . . Rhytidoporus Uhl. p. 74

4. Membrane half of hemelytral length (Figs. 4 and 15) 5

Membrane not more than two-fifths of hemelytral length. 6

5. Terminal process large, elongate oval, with one to three longitudinal rugae discally (Fig. 89) . . . . . Cydnus Fab. p. 110

Terminal process of peritreme small, not elongate (Figs. 100 and 101). . . . . Ectinopus Dall. p. 114

6. Metapleural evaporatorium very limited, just outlining peritreme, not extending to posterior coxa (Fig. 90) . . .Microporus Uhl. p. 96

Metapleural evaporatorium extensive, distinctly surpassing apex of peritreme and extending nearly to posterior coxa (Figs. 103, 106) 7

7. Terminal process of peritreme scoop-shaped or auricular, with osteole conspicuously visible ventrally at its base (Fig. 95). . . . . .Onalips Sign. p. 124

Terminal process of peritreme flat, simply expanded posteriorly as a more or less polished lobe, osteole opening posteriorly, not conspicuous ventrally (Figs. 96, 97) . . . . Melanaethus Uhl. p. 132

8. Pronotum anteriorly with deep, sharply impressed line paralleling anterior margin from side to side (this line usually impunctate). . 9

Pronotum anteriorly without this impressed line, although often with a row of punctures in the same area (rarely with partial, vague line laterally) 10

9. Apex of clypeus and submargin of jugum with a complete row of coarse punctures within reflexed margin, these punctures giving rise to short, stout pegs and interspersed longer hairs . . . . Homaloporus Uhl. p. 183

Apex of clypeus without and submargin of clypeus without or with a partial row of punctures giving rise to short stout pegs (Figs. 46-49) . . . . . Pangaeus Stal p. 191

10. Posterior tibia conspicuously compressed, anterior and posterior faces glabrous, not spined; spines of postero-ventral margin conspicuously longer, thinner and more tapering than those of dorsal margin (Figs. 34, 36) 11

Posterior tibiae not or only weakly compressed; dorsal and ventral spines about equally developed 12

11. Labial II with large, semicircular, foliaceous lobe, this often hidden between anterior coxae (Fig. 36) . . . Prolobodes A.&S. p. 266

Labial II somewhat compressed, but without large, foliaceous lobe (Fig. 34). . . . . Cyrtomenus A.&S. p. 276

12. Head with a complete row (extending from eye to apex of jugum) of coarse, more or less contiguous punctures giving rise to numerous long cilia and usually also to a row of pegs . . . . . Tominotus M.&R. p. 314

Head without a complete row (absent or extending not more than three-fourths of way to apical angle of jugum) of coarse setigerous punctures; pegs never present. . . Dallasiellus Berg p. 367

Genus Rhytidoporus Uhler

1877 Rhytidoporus Uhler, Bull. United States Geol. Geogr.Surv. Terr., 3:380.

1877 Cryptoporus Uhler, ibid., 3:381, nec Motschulsky (1858) in Coleoptera.

1904 Bergthora Kirkaldy, Entomol., 37:280.

1926 Findalia Jensen-Haarup, Ent. Medell., 16:51.

DIAGNOSIS: The narrow, shining band-like extension of the peritreme which interrupts the metapleural evaporatorium anteriorly (Figs. 92-94) will separate the members of this genus from all others in the Western Hemisphere.

DESCRIPTION: Small, length of body, 3.5-6, oval, widest approximately at or slightly posterior to middle; dorsum much less convex than venter. HEAD: length nearly two-thirds width, flattened or slightly convex above; juga as long as clypeus; juga with fine marginal carina dorsally, either with complete (including apex of clypeus) row of submarginal punctures with their setae becoming finer towards eye, or with one preocular

seta and one half way to apex; eyes large, but slightly projecting; ocelli absent or well developed, when present located on or slightly behind a line connecting hind margins of eyes and separated from eyes by not more than twice transverse ocellar width; antennae five-segmented, I shortest, II slightly shorter or equal to III, latter subequal to or shorter than IV which may be almost as long as V; bucculae moderately high, reaching nearly to base of head; labium reaching between middle coxae (lucida?), IV shortest, II longest, III shorter than I, II slightly compressed but without foliaceous lobe. PRONOTUM: length about half width, distinctly narrowed from base; side margins carinate, straight or convex on basal two-thirds or more, with four to eight or about twenty setigerous punctures submarginally; anterior margin shallowly to deeply emarginate; transverse impression weak to absent, usually marked by a row of distinct punctures; posterior margin broadly but slightly convex, all angles rounded. SCUTELLUM: shorter than, equal to or longer than width, triangular, apex narrowed and less than or slightly wider than half of membranal suture; disc with distinct punctures. HEMELYTRON: areas weakly or well-defined, membranal suture straight or slightly projecting laterally; costa with one or two, or about fifteen to twenty setigerous punctures; membrane not over two-fifths of hemelytral length, usually reaching or slightly surpassing apex of abdomen, hyaline and faintly clouded with brown. PROPLEURON: moderately convex anterior to depression, latter with or without coarse punctures; prosternal carinae low, rather sharp; anterior margin slightly lobulate either side of middle. MESOPLEURON: (Figs. 92-94) flat, evaporative area occupying all but extreme lateral area and postero-lateral angle; posterior margin entire; mesosternum prominent to subcarinate along median line, with numerous long hairs. METAPLEURON:

(Figs. 92-94) flat, osteolar canal extended laterally to limit of evaporative area as a flat, posteriorly sharply delimited band which is in large part polished; osteole usually opening at base of a lobulate auricle, latter absent (Fig. 93) in subgenus Bergthora. LEGS: moderately long, slender; anterior tibia (Fig. 124) moderately widened, with seven or eight stout spines on outer margin, not prolonged beyond tarsal insertion; middle and posterior tibiae slender; latter terete, slightly more than one-third body length; tarsal II shortest, I subequal to or shorter than III. STERNITES: strongly convex, shining, with or without setigerous punctures; posterior margin of each sternite with numerous fine, sharp crenulations on lateral third or more.

One third (?) instar nymph collected with adults on "strawberry" showed the head with the fine marginal carina dorsally and the submarginal series of stout spines and longer cilia.

GENOTYPE: Rhytidoporus indentatus Uhler (1877:380), monobasic; of Cryptoporus Uhler (1877) nec Motschulsky (1858) in Coleoptera, Cryptoporus compactus Uhler (1877:382), monobasic; Bergthora Kirkaldy (1904) was proposed as a new name for Cryptoporus Uhler and so takes Cryptoporus compactus Uhler as genotype by objective synonymy; of Findalia Jensen-Haarup, Findalia lucida Jensen-Haarup (1926:52), by original designation and monobasic.

DISTRIBUTION: The specimens studied indicated the range of this genus to be from Florida, New Mexico and Texas in the southern United States and south into Mexico, Brazil and the West Indies. Of the latter, specimens have been studied from Cuba, Haiti, Dominican Republic, Puerto Rico and St. Croix in the Virgin Island group.

DISCUSSION: The devaluation of the above three "genera" to subgeneric status is based chiefly on the fact that all three possess the important and unique apical modification of the peritreme. Admittedly, the three subgenera are not equally closely related. The subgenera Rhytidoporus and Bergthora, as indicated by the following key, are more closely related to each other than to Findalia. The fact that no male specimen of Findalia was available for study was unfortunate because it prevented determination of the position of that subgenus in relation to the other two as regards the shape of the male gonostylus. In respect to this structure, Rhytidoporus shows an interesting divergence from Bergthora in possessing an unusual mesal, spine-like projection at the dorsal angle (Figs. 193 and 194) which is absent in the single species of the latter subgenus (Fig. 195).

Key to the Subgenera of Rhytidoporus

1. Submargin of head with two submarginal setigerous punctures, one in front of eye and one half way to apex; metapleural evaporatorium reaching lateral margin of segment. . . . . Findalia J.-Haar. p. 89

   Submargin of head (including apex of clypeus) with complete row of coarse, close-set setigerous punctures; metapleural evaporatorium not reaching lateral margin of segment 2

2. Costa with one or two setigerous punctures; osteolar auricle distinctly developed (Fig. 92) . . . . . Rhytidoporus Uhl. p. 78

   Costa with about fifteen setigerous punctures; osteolar auricle absent (Fig. 93) . . . . . Bergthora Kirk. p. 85

Subgenus Rhytidoporus Uhler

DIAGNOSIS: This subgenus is sufficiently characterized by the features listed in the key, but the small number of setigerous punctures on the costa has proved the most practical in use.

SUBGENOTYPE: Rhytidoporus indentatus Uhler (1877:380), monobasic.

DISTRIBUTION: The members of this subgenus apparently are native to the West Indies although one species has invaded the southern part of peninsular Florida on the mainland. This is in contrast to the lone species of each of the other two subgenera which have continental ranges.

DISCUSSION: The included species appear rather closely allied to each other, obsoletus new species being the most distinct.

Key to the Species of the Subgenus Rhytidoporus

1. Ocelli present, prominent; membrane longer than basal width. . . . 2
   Ocelli absent, membrane short, length not greater than basal width. . . . . obsoletus n.sp. p. 83
2. Head broadly rounded, semicircular or slightly truncated apically (Fig. 52); pronotal disc immediately behind anterior emargination with a single row of a few (usually two to seven) coarse punctures between setigerous punctures posterior to inner angle of eyes . . . . . indentatus Uhl. p. 80
   Head less broadly rounded (Fig. 53); pronotum immediately behind anterior emargination with many (about fifteen) coarse punctures between setigerous punctures. . . . . barberi n.sp. p. 78

Rhytidoporus (Rhytidoporus) barberi new species

DIAGNOSIS: This new species, here described from a single male,

may be characterized by the presence of ocelli and the numerous (about fifteen) punctures immediately behind the anterior emargination of the pronotum. The short, mesally projecting dorsal spine of the gonostylus also separates this from the males of other known species.

DESCRIPTION: MALE (only specimen known):- Oval. HEAD: wider than long, 1.13:0.70; interocular width 0.66; margins of paraclypei less broadly rounded (Fig. 194); antennal segments I:II:III:IV:V:: 0.16:0.23:0.26:0.36:0.43; surface shining, with few weak, radiating rugae, three or four moderate punctures anterior to and between ocelli; labial segments I:II:III:IV:: 0.46: 0.56: 0.46: 0.40. PRONOTUM: nearly twice as wide as long, 2.34: 1.23; anterior lobe with moderate, subapical impression bearing about fifteen distinct punctures, and with several punctures laterally; transverse impression obsolete, marked by an irregular row of close-set, moderate punctures; posterior lobe with a few scattered punctures discally; side margins with six setigerous punctures. SCUTELLUM: length and width equal, 1.43, irregularly and distinctly punctured over surface except at base and apex. CORIUM: shining, discal area with numerous fine punctures and several coarser ones scattered over full length; clavo-corial suture distinctly impressed, bordered by two complete rows of distinct, coarse punctures; limiting impressions of radial veins punctured; clavus with a more or less regular row of distinct punctures on basal half; membrane hyaline, faintly yellowed, with a median brownish cloud; longer than basal width, surpassing apex of abdomen by about one-third its length. TERMINALIA: gonostylus as illustrated (Fig. 194), mesal dorsal tooth short, edge posterior to it deeply concave. LENGTH of body, 4.1.

TYPE DATA: HOLOTYPE male, "St. Croix, V. I., H. A. Beatty, No. 741/1937," in the collection of the United States National Museum.

DISTRIBUTION: Known only from the holotype male which was from the Virgin Islands.

DISCUSSION: This specimen bore a label of H. G. Barber as "Aethus sp.-?, near indentatus." Because of this finely studied conclusion the species is being named in honor of that outstanding American hemipterist.

Rhytidoporus (Rhytidoporus) indentatus Uhler

1877 Rhytidoporus indentatus Uhler, Bull. U. S. Geol. Geogr. Surv. Terr., 3:380.

1880 Rhytidoporus indentatus Distant, Biol. Centr.-Amer., Hemip.-Heterop., 1:4.

1882 Aethus (Rhytidoporus) indentatus Signoret, Ann. Soc. Ent. France, 1882:38, pl. 2, fig. 80.

1886 Aethus indentatus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus indentatus Lethierry and Severin, Gen. Catal. Hemip., 1:66.

1910 Cydnus indentatus Banks, Catal. Nearct. Hemip., p. 99.

1917 Aethus indentatus VanDuzee, Univ. California Pubs. Ent., 2:20.

1932 Aethus indentatus Barber and Bruner, Jour. Dept. Agr. Puerto Rico, 16:235.

1939 Aethus indentatus Barber , Sci. Surv. Porto Rico and Virgin Islands, 14:271.

1939 Aethus (Rhytidoporus) indentatus Torre Bueno, Ent. Amer., 19:179.

DIAGNOSIS: The presence of ocelli and the absence of or the presence of but a few coarse punctures immediately posterior to the anterior pronotal emargination sets this species apart from others in the group (Fig. 5).

DESCRIPTION: MALE:- Oval. HEAD: wider than long, 1.12 (1.04-1.30): 0.78

(0.73-0.86); interocular width 0.66 (0.61-0.76); surface smooth, with wide, very feeble radiating lines, impunctate or with a few fine punctures anterior to ocelli; ocellar width 0.06 (0.06-0.08) subequal to half of space separating it from an eye, 0.11 (0.10-0.13); antennals I:II:III:IV:V:: 0.24 (0.23-0.30): 0.22 (0.20-0.26): 0.29 (0.24-0.36): 0.37 (0.33-0.46): 0.51 (0.46-0.56); labial segments I:II:III:IV:: 0.40 (0.36-0.46): 0.59 (0.53-0.70): 0.45 (0.40-0.53): 0.33 (0.30-0.40). PRONOTUM: wider than long, 2.28 (2.08-2.73): 1.26 (1.07-1.43); transverse impression near midlength, weakly indicated and usually obsolete at middle; anterior lobe transversely convex, usually with a noticeable triangular impression anteriorly, surface polished, impunctate except for a few punctures behind anterior emargination and usually a variable number near sides; site of transverse impression with an irregular row of fine punctures which are sparse medially and denser laterally; posterior lobe impunctate or with a few widely scattered, very fine punctures; lateral submargins with five or six setigerous punctures. SCUTELLUM: as long as or slightly longer than basal width, 1.46 (1.36-1.69): 1.41 (1.30-1.62); apex narrowed; impunctate basally and at apex, discally with several scattered punctures. HEMELYTRON: areas well defined, surface polished, discally with few or no coarse punctures; two inner rows of punctures bordering clavus distinct, second row nearly complete; clavus with a partial row of punctures on basal half or less. TERMINALIA: genital capsule with rim faintly recurved, entire or vaguely emarginate at middle apex; gonostylus as illustrated (Fig. 193) the dorso-medial projection very long. Length of body, 4.29 (3.85-5.00).

FEMALE:- very similar to male, but with impression of anterior pronotal lobe weak or absent and measurements slightly larger. HEAD: width: length::

1.19 (1.06-1.33): 0.77 (0.73-0.86); interocular width, 0.71 (0.63-0.80); ocellar width: space separating it from eye:: 0.06 (0.06-0.08): 0.12 (0.10-0.16); antennals I:II:III:IV:V:: 0.24 (0.20-0.26): 0.24 (0.18-0.30): 0.30 (0.26-0.36): 0.42 (0.36-0.53): 0.54 (0.50-0.60); labial segments I:II:III: IV:: 0.43 (0.36-0.51): 0.61 (0.53-0.73): 0.48 (0.41-0.60): 0.33 (0.33-0.36). PRONOTUM: width: length:: 2.43 (2.15-2.79). SCUTELLUM: length: width:: 1.61 (1.36-1.89): 1.50 (1.30-1.75). LENGTH of body, 4.42 (3.85-5.28).

TYPE DATA: The type is in the collection of the United States National Museum, vide Sailer (1952). Uhler (loc. cit.:381) wrote of the material on which his descriptions were based as follows: "Inhabits Cuba, and has been collected in various parts of the island, by Prof. Poey and Mr. Charles Wright. Southern Florida, Dr. E. Palmer."

DISTRIBUTION: This species has been represented by material from all the major islands of the Greater Antilles, which appear to be its native habitat and from whence it has invaded the southern part of peninsular Florida.

DISCUSSION: The present species is quite variable in length and width of body, in median impression and lateral punctation of anterior lobe of pronotum and in proportionate length of antennal segments II and III (II varying from two-thirds as long to subequal in length to III). Without intermediates one might be tempted to separate some of these, but as lots bearing the same data often showed these as well as intermediates in varying combinations the temptation was greatly lessened. The most persistent doubt as to the validity of this lumping was raised by a small series of large specimens from the Dominican Republic and Puerto Rico which show a more marked impression of the anterior pronotal lobe in both

sexes. However, the males of that series show the long medio-dorsal projection on the gonostylus that is present in the others assigned here. Some of this material was reported by Barber and Bruner (1932) as indentatus, but their comment, "The males have the anterior disk on the on t he pronotum quite plainly depressed," was not true of all males studied as some of the smaller ones lacked the depression.

In spite of these tentative conclusions, goodly series of specimens from more localities might validate some sort of separation of some of these variations.

Wolcott (1936:181) reported this species "at light," "on dung" and "eaten by Ameiva exsul", an iguana, in Puerto Rico. Later (1948:189), he wrote that it had been collected "From numerous humid localities of coast and mountains" on the same island, and repeated that it formed "an item of food of the iguana, Ameiva exsul."

SPECIMENS STUDIED: UNITED STATES: Florida: Dade Co., Deerfield, Ft. Pierce, Homestead, Lakeland, Lake Placid, Miami, Royal Palm; for all months of the year. CUBA: Buenos Aires (Trinidad Mts.), Cabanas, Guanajay, Mina Carlota (Trinidad Mts.), Santiago de las Vegas, Soledad, Upper Yara Valley; August-April. HAITI: Desbarriere, Ennery, Etang Lachaux, Grand Riviere, Jacmel, Kenskoff, mts. near Port-au-Prince; January, September, October. DOMINICAN REPUBLIC: Constanza, Mt. Diego de Ocampo, Sanchez; July, August. PUERTO RICO: Acquirre, El Yungue; January, May, October. ST. CROIX ISLAND: "s. end;" July.

Rhytidoporus (Rhytidoporus) obsoletus new species

DIAGNOSIS: Any of several features will separate this species from the others within the genus. The absence of ocelli, the weakly defined

corial areas, the very elongate and slender scutellar apex or the short membrane may be relied upon. Unfortunately, this form is known only from females so the validity of these characters in relation to the males is purely conjectural.

DESCRIPTION: FEMALE (only sex known): Oval. HEAD: wider than long, 1.32 : 0.87 (0.86-0.90), interocular width, 0.91 (0.90-0.93); surface smooth, with several very weak, radiating rugae; ocelli absent; antennal segments I:II:III:IV:V:: 0.28 (0.26-0.30): 0.32 (0.30-0.33): 0.36 (0.36-0.40): 0.51 (0.50-0.53): 0.67 (0.63-0.70); labial segments I:II:III:IV:: 0.62 (0.60-0.66): 0.77 (0.76-0.80): 0.63 (0.60-0.66): 0.49 (0.46-0.50). PRONOTUM: more than twice as wide as long, 1.48 (1.43-1.53): 0.71 (0.70-0.73); transversely convex, smooth, with scattered moderate punctures submarginally to apex and sides of anterior lobe, along obsolete transverse impression and on disk of posterior lobe; side margins with five to seven setigerous punctures, none at basal angles. SCUTELLUM: distinctly longer than broad, 1.17 (1.13-1.23): 0.97 (0.93-1.03); irregularly punctured over surface except at base and apex; latter very narrowed and elongate, the narrowed tip about twice as long as broad. CORIUM: shining, very faintly alutaceous, obsoletely wrinkled; corio-claval suture obsolete, the two rows of bordering punctures very weak; usually not or only very weakly punctate discally, along radial vein and in exocorial area; membrane brownish-hyaline, not surpassing apex of abdomen, length subequal to basal width. LENGTH of body, 5.43 (5.28-5.71).

TYPE DATA: HOLOTYPE female, "LaVisite & vic., LaSelle Range, 5-7000 ft., Sept. 16-23, Haiti, 1934, Darlington," in the Museum of Comparative

Zoology, Harvard University. PARATYPES: same data as holotype, 5f (MCZ, USNM, RCF).

DISTRIBUTION: This species is known only from the type locality.

DISCUSSION: This very distinct species is known only from six female specimens. However, sexual dimorphism is not strongly marked within this family so one may expect the males also to show the unusual features mentioned above.

Subgenus Bergthora Kirkaldy

1877 Cryptoporus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:381, nec Motschulsky (1858) in Coleoptera.

1904 Bergthora Kirkaldy, Entomol., 37:280.

DIAGNOSIS: The single member of this subgenus separates most easily from the species in the other subgenera by the more numerous (fifteen to twenty) setigerous punctures on the costa.

SUBGENOTYPE: Cryptoporus compactus Uhler (1877:382), monobasic, of Bergthora, the same species by objective synonymy, the new generic name having been proposed to replace preoccupied Cryptoporus Uhler for which the type had already been fixed.

DISTRIBUTION: The members of this subgenus occur in a limited area in the southwestern United States, in Texas, New Mexico and Arizona, and all of Mexico. As yet, it is not known to occur on any of the islands to the east or west of Mexico.

DISCUSSION: The lone species is described and discussed below.

Rhytidoporus (Bergthora) compactus (Uhler)

1877 Cryptoporus compactus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:382.

1882 Aethus (Cryptoporus) compactus Signoret, Ann. Soc. Ent. France, 1882: 41, pl. 2, fig. 83.

1886 Aethus compactus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus compactus Lethierry and Severin, Gen. Catal. Hemip., 1:65.

1910 Cydnus compactus Banks, Catal. Nearct. Hemip., p. 99.

1917 Aethus compactus Van Duzee, Univ. California Pubs. Ent., 2:20.

1939 Aethus (Cryptoporus) compactus Torre Bueno, Ent. Amer., 19:239.

DIAGNOSIS: Compactus is the only species in the subgenus.

DESCRIPTION: MALE:- oval, widest posterior to middle. HEAD: length two-thirds of width, 0.72 (0.78-0.93): 1.21 (1.16-1.33); interocular width, 0.82 (0.78-0.93); anterior outline semicircular; clypeus as long as juga, slightly narrowed apically; surface convex, shining, with numerous minute punctures and several obsolete, radiating rugae; ocelli small, separated from eye by space almost three times transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate impunctate on apical half, obsoletely punctured on basal half; antennals, I, 0.25 (0.23-0.26): II, 0.21 (0.16-0.23): III, 0.23 (0.20-0.26): IV, 0.26 (0.23-0.30): V, 0.28 (0.26-0.30); bucculae almost as high as labial II, labium reaching between middle coxae, segments, I, 0.44 (0.43-0.46): II, 0.53 (0.50-0.56): III, 0.45 (0.40-0.50): IV, 0.32 (0.28-0.36). PRONOTUM: length slightly more than half width, 1.31 (1.23-1.49): 2.56 (2.40-2.89); anterior margin deeply, biemarginate; lateral margins entire, middle third straight or very weakly concave, submarginal row with about thirty to thirty-five

setigerous punctures; transverse impression obsolete, usually marked by medially interrupted row of moderate punctures; anterior lobe with numerous small punctures subapically and laterally; posterior lobe with several irregular, small punctures and many minute punctures. SCUTELLUM: length equal to, longer than or shorter than width, 1.59 (1.49-1.89): 1.66 (1.56-1.82); weakly alutaceous; disc with numerous well-separated large punctures and many minute punctures interspersed, occasionally with small, transverse rugae. HEMELYTRON: clavus and corium distinctly alutaceous; clavus with numerous distinct punctures, sometimes arranged in rows; mesocorium with numerous distinct punctures, with one and usually a second complete row of punctures paralleling claval suture; exocorium with numerous distinct punctures over entire length; costa with fifteen to twenty setigerous punctures; membranal suture nearly straight, lateral angle not produced; membrane longer than basal width, reaching or surpassing apex of abdomen. PROPLEURON: feebly to distinctly alutaceous, impunctate. MESOPLEURON: lateral area impunctate. METAPLEURON: lateral area impunctate. STERNITES: each with submedian transverse row of setigerous punctures; alutaceous, roughened on lateral third by short, longitudinal rugae. TERMINALIA: genital capsule punctate in lateral angle, apical margin entire or weakly sinuate medially; gonostylus (Fig. 195) without mesal projection at dorsal angle. LENGTH of body, 4.22 (2.00-4.57).

FEMALE:- similar to male, measurements mostly averaging larger. HEAD: length: width:: 0.79 (0.76-0.90): 1.27 (1.20-1.36); interocular width, 0.85 (0.80-0.90); antennae, I, 0.28 (0.26-0.30): II, 0.20 (0.16-0.23): III, 0.24 (0.23-0.28): IV, 0.28 (0.26-0.30): V, 0.30 (0.30-0.30); labials, I, 0.45 (0.43-0.50): II, 0.55 (0.50-0.63): III, 0.43 (0.40-0.46): IV, 0.31 (0.30-0.33).

PRONOTUM: length: width:: 1.38 (1.30-1.49): 2.74 (2.60-2.93). SCUTELLUM: length: width:: 1.75 (1.62-1.89): 1.78 (1.62-1.89). LENGTH of body, 4.42 (4.07-4.85).

TYPE DATA: The type is in the collection of the United States National Museum, vide Sailer (1952). Uhler (loc. cit.) gave the type locality as "Galveston Island, Texas."

DISTRIBUTION: The range of this insect as determined from specimens studied extends from across the southwestern United States from Texas through New Mexico and Arizona to California south to the state of Yucatan in southern Mexico.

DISCUSSION: This species appears to be a common species on the mainland within its range. It is not yet known to occur on any of the islands of the Caribbean Sea, thereby differing from the members of the subgenus Rhytidoporus.

Pearse's (1939:239) note on this species, "in rubbish," in the Mexican state of Yucatan, was accidentally entered under the family name Fulgoridae. One of Pearse's specimens was seen during this study. In the collection of the Museum of Comparative Zoology, Harvard University, there is a specimen collected by W. M. Wheeler and mounted with two ants, suggesting the possibility that they were found in close association. The hemipteron is erroneously labelled as Homaloporus congruus, but as yet, the ants have not been determined to species.

SPECIMENS STUDIED: 36 males, 35 females. UNITED STATES: Arizona: Globe, Huachuca Mts., Patagonia, Pinery Canyon (Chiricahua Mts.); March, July. California: Coral Beach (Los Angeles Co.), Hynes, San Diego Co., Saticoy; April, May, October. New Mexico: Mesilla Park; December.

Texas: Austin, Galveston, Padre Isl., Tyler, Victoria; February to May. MEXICO: Distrito Federal: Penon Viejo; April, June. Mexico: Tejupilco; June. Sinaloa: Mazatlan, Rosario; March. Sonora: Guaymas; July. Yucatan.

Subgenus Findalia Jensen-Haarup NEW STATUS

1926 Findalia Jensen-Haarup, Ent. Medell., 16:52.

DIAGNOSIS: The presence of but two submarginal setigerous punctures on each jugum readily separates this subgenus from the other two, each of which bears a complete row of submarginal setigerous punctures on jugum.

DESCRIPTION: HEAD: jugum with two submarginal setigerous punctures, one immediately in front of eye, one near middle; vertex with curved, obtuse carina between ocelli. PRONOTUM: transverse impression absent; surface nearly impunctate; side margins with but four submarginal setigerous punctures. HEMELYTRON: membrane small, about one-fourth of hemelytral length. METAPLEURON: with distinct auricular process at osteole; evaporatorium reaching side margin of segment.

SUBGENOTYPE: Findalia lucida Jensen-Haarup (1926:52), monobasic.

DISTRIBUTION: The locality given with the original description was "Brazil," but the type specimen bears no locality label.

DISCUSSION: Except for the development of the peritreme (a structure which the present author believes to be a prime phylogenetic indicator), the single species of the subgenus is well removed from the other species of the genus.

Rhytidoporus (Findalia) lucida (Jensen-Haarup) NEW COMBINATION

1926 Findalia lucida Jensen-Haarup, Ent. Medell., 16:52.

DIAGNOSIS: Since this is the only species known for this subgenus the subgeneric characters will place it within the genus.

DESCRIPTION: (known only from the type female) FEMALE:- elongate oval, nearly parallel-sided but slightly wider behind midlength. HEAD: length about two-thirds width, 0.56: 0.88; interocular width, 0.53; anterior outline semicircular, clypeus as long as juga, but slightly narrowed at apex; surface alutaceous, with scattered minute punctures; jugum with two submarginal setigerous punctures, one preocular and one near middle; ocelli moderately large, separated from eye by space subequal to transverse diameter of ocellus; jugum ventrally and maxillary plate polished, impunctate; antennals, I, 0.20: II-V missing; bucculae nearly as high as labial II; labium with segments III and IV missing, I, 0.30: II, 0.53. PRONOTUM: length less than half of width, 0.94: 2.00; anterior margin deeply, doubly emarginate; lateral margin entire, more strongly curved on apical half, with submarginal row of four setigerous punctures; transverse impression absent, marked by one or two distinct punctures at extreme ends; surface, except for a few fine punctures near anterior margin and some scattered laterally, virtually impunctate. HEMELYTRON: clavus and corium finely alutaceous; clavus with one longitudinal row of punctures; mesocorium with two complete rows of punctures paralleling claval suture, discally with a few distinct punctures which become more numerous apically; exocorium weakly convex, with numerous obsolete punctures for full length; costa very fine, with one small setigerous puncture subbasally; membranal suture slightly concave; membrane surpassing apex of abdomen, slightly

longer than basal width. PROPLEURON: shining, obsoletely alutaceous, impunctate; prosternal carinae sharp, less than half as high as labial II. MESOPLEURON: evaporatorium filling all but narrow anterior, posterior and extreme lateral margins of segments. METAPLEURON: (Fig. 94) with well-developed auricle near osteole; evaporatorium extending to lateral margin of segment; lateral area with few distinct punctures near evaporatorium. STERNITES: polished, with numerous widely separated punctures on lateral third. LENGTH of body, 3.70.

TYPE DATA: The type female is in the collection of the Universitetes Zoologiske Museum in Copenhagen, Denmark. It was made available for study through the kindness of Dr. S. L. Tuxen of that institution. Although Jensen-Haarup (loc. cit.) cited "Brazil" as the type locality, the type specimen bears no locality label (see discussion below).

DISCUSSION: In the absence of a locality label on the type, a question arises as to the source of the locality cited by Jensen-Haarup. One possible explanation is that he derived it from a manuscript "n.sp." label on the pin, the generic name of which was apparently based on the name of that country. Although some doubt may thus arise as to this truly being a species of the Western Hemisphere, the ligulate extension of the peritreme allies it to the present genus--and since this development is not known from any other locality in the world the logical conclusion is that lucida is a species of the New World.

Genus Macroporus Uhler

1877 Macroporus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:375.

DIAGNOSIS: The shape of the osteolar peritreme here extends more than

three-fourths of the way to the lateral margin of the metapleuron where it ends in a conspicuous, recurved, polished lobe (Fig. 91).

DESCRIPTION: Small (3.2-4.4), broadly oval, greatest width behind middle; dorsum slightly, venter moderately convex. HEAD: length almost three-fifths of width, slightly convex above; outline semicircular, clypeus as long as juga; with fine, dorsal carina marginally; submargin, including clypeus, with complete row of coarse, close-set setigerous punctures giving rise to a complete row of pegs and a few hairs; eyes small, entire, moderately projecting; ocelli well developed, moderate in size, situated slightly posterior to line connecting hind margins of eyes, separated from eye by space less than transverse ocellar width; antennae five-segmented, II shortest and most slender, III, IV and V increasing slightly in length, all longer than I; bucculae low, reaching almost to base of head (Fig. 30); labium reaching between middle coxae, II longest, compressed, without semicircular foliaceous lobe, III longer than I and IV which are subequal. PRONOTUM: length about half width; lateral margin entire, slightly convex, narrowing from base; anterior margin deeply and simply emarginate; posterior margin subtruncate; anterior submarginal impressed line distinct from side to side; transverse impression post-median, obsolete; dorsal surface abundantly punctate; lateral submargin with about fifteen setigerous punctures. SCUTELLUM: slightly wider than long, triangular, slightly narrowed at apical third where it is less than one-third of membranal suture; apex narrowly rounded; disc punctured. HEMELYTRON: corial areas poorly defined; membranal suture straight, strongly oblique; costa arcuate, explanate, with no setigerous punctures; membrane distinctly less than half of hemelytral length. PROPLEURON: alutaceous, impunctate; prosternal carinae

very low; anterior margin not lobulate either side of middle. MESOPIEURON: faintly concave, evaporatorium extensive, covering most of segment, reaching lateral and posterior margins; posterior margin entire; mesosternum prominent and subcarinate along midline, with numerous hairs. METAPIEURON: (Fig. 91) nearly flat, evaporatorium reaching almost to lateral margin; peritreme very long, reaching nearly to lateral margin of evaporative area, formed as an open trough for basal two-thirds, apical third a large, recurved, polished lobe; osteole opening at base of trough. LEGS: moderately long; anterior tibia (Fig. 121) moderately widened, with seven stout, blunt spines dorsally, not prolonged beyond tarsal insertion; tarsal II shortest; middle and posterior tibiae terete; latter (Fig. 143) straight, little more than half as long as body, without spines on posterior face. STERNITES: convex, impunctate, alutaceous, dull laterally, shining along broad median area. TERMINALIA: male genital capsule opening dorsally; gonostylus as figured for species (Fig. 196).

GENOTYPE: Macroporus repetitus Uhler (1877:375), monobasic.

DISTRIBUTION: The range of this genus is that of its only included species and appears confined to the western United States, in California (and New Mexico, Torre Bueno, 1939). The specimen which Uhler (loc. cit.) reported from "the vicinity of Baltimore" is now in the collection of the National Museum and bears the label, "Md." The specimen is of the present species but is undoubtedly mislabelled as no other specimens have been reported from the eastern United States. Therefore, unless supported by additional captures, that record should not be included in the range of the genus.

DISCUSSION: This genus contains the single species which is treated

below.

Macroporus repetitus Uhler (Fig. 9)

1876 Macroporus repetitus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 1:278.

1877 Macroporus repetitus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:375.

1881 Macroporus repetitus Signoret, Ann. Soc. Ent. France, 1881:329, pl. 10, fig. 46.

1886 Macroporus repetitus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Macroporus repetitus Lethierry and Severin, Gen. Catal. Hemip., 1:64.

1910 Macroporus repetitus Banks, Catal. Nearct. Hemip., p. 100.

1917 Macroporus repetitus VanDuzee, Univ. California Pubs. Ent., 2:19.

1939 Macroporus repetitus Torre Bueno, Ent. Amer., 19:178.

DIAGNOSIS: This is the only species known in this well-marked genus.

DESCRIPTION: MALE:- HEAD: length nearly three-fourths of width, 0.64 (0.58-0.70): 0.89 (0.83-0.98); interocular width, 0.63 (0.60-0.68); juga as long as clypeus, narrowing it apically; juga and vertex with numerous, irregularly placed punctures; ocelli small, separated from eye by a space almost three times transverse ocellar diameter; jugum ventrally and maxillary plate impunctate; antennals, I, 0.20 (0.17-0.23): II, 0.13 (0.12-0.14): III, 0.27 (0.24-0.29): IV, 0.27 (0.23-0.31): V, 0.33 (0.32-0.34); bucculae low, height about half of labial II; labials, I, 0.31 (0.30-0.33); II, 0.48 (0.46-0.50): III, 0.39 (0.36-0.43): IV, 0.26 (0.26-0.29). PRONOTUM: length a little more or less than half of width, 1.01 (0.90-1.17): 2.02 (1.82-2.28); anterior lobe polished, moderately punctured except for U-shaped discal area, punctures slightly coarser towards

margins; posterior lobe with numerous close-set punctures similar to those of transverse impression. SCUTELLUM: distinctly wider than long, 1.34 (1.17-1.49): 1.02 (0.90-1.10); surface, except basal angles moderately closely punctured almost to apex, latter with a low, median carina. PRO-, MESO- and METAPLEURAE: as described for genus. LEG, STERNITES and TERMINALIA: as described for genus, gonostylus as illustrated (Fig.196). LENGTH of body, 3.74 (3.35-4.12).

FEMALE:- very similar to male but punctures of posterior pronotal lobe a little coarser and more distinct; and measurements more variable: HEAD: length: width:: 0.64 (0.55-0.68): 0.92 (0.80-1.00); interocular width, 0.65 (0.56-0.72); antennals, I, 0.21 (0.17-0.26): II, 0.13 (0.13-0.16): III, 0.28 (0.25-0.33): IV, 0.29 (0.26-0.33): V, 0.33 (0.27-0.37); labials, I, 0.34 (0.32-0.38): II, 0.52 (0.44-0.60): III, 0.40 (0.34-0.51): IV, 0.28 (0.27-0.31). PRONOTUM: length: width:: 1.08 (0.84-1.19): 2.11 (1.75-2.28). SCUTELLUM: width: length:: 1.36 (1.07-1.56): 1.10 (0.91-1.19). LENGTH of body, 4.02 (3.42-4.35).

TYPE DATA: The type is in the collection of the United States National Museum, vide Sailer (1952). Uhler (loc. cit.) reported it "From the vicinity of San Francisco," The other locality given in the original description, "in the vicinity of Baltimore," is undoubtedly in error, probably resulting from mislabelling as the specimen is still in the Uhler collection at the National Museum. No subsequent specimen has been labelled for the eastern United States.

DISTRIBUTION: All specimens studied (except for Uhler's "Md." specimen) were labelled for California, but Torre Bueno (1939) listed it also from New Mexico.

DISCUSSION: Ecological data on specimens consisted of a phrase, "in soil," on a series consisting of one adult and three young instars; and one note of "Ceanothus."

SPECIMENS STUDIED: 28 males, 49 females. UNITED STATES: California: Camp Baldy, Carmel, Greenhorn Mts. in Tulare Co., Independence, Monterey, Mt. Diablo, Mt. Wilson, Paraiso Springs, Pinnacles Nat. Mon., Riverside Co., San Diego Co., San Francisco, San Jacinto Mts., Sequoia Nat. Park, Suisun, Tan Bark Flat, Yuba City; October to June.

Genus Microporus Uhler

1872 Microporus Uhler, Fifth Ann. Rep. United States Geol. Surv. for 1871, p. 394 (name only).

1876 Microporus Uhler, Bull. United States Geol. Geog. Surv. Terr., 1:275.

DIAGNOSIS: The very strongly restricted metapleural evaporatorium which just outlines the peritreme marks this genus as distinct from the others in the Western Hemisphere.

DESCRIPTION: Small, 3.5-5.2, broadly roundly oval, greatest width slightly posterior to midlength; dorsum moderately, venter strongly convex. HEAD: length about three-fourths width; oblique, slightly to decidedly convex above; clypeus almost as long as juga, both with fine marginal carina dorsally and a sunken submarginal line with coarse contiguous setigerous punctures bearing short blunt pegs and several long hairs; eyes well developed but small, projecting; ocelli well developed, moderate in size, separated from eyes by space about four times transverse ocellar width; antennae five-segmented, II shortest, I, III, IV and V subequal in length, IV and V stoutest; bucculae low, reaching almost to base of head; labium almost or quite reaching middle coxae, II longest, weakly compressed,

without semicircular foliaceous lobe, I and III subequal, longer than IV. PRONOTUM: length about three-fifths width, side margins carinate, narrowing from base, basal half or more straight, with broad, submarginal band of numerous setigerous punctures; anterior margin moderately, simply emarginate; posterior margin broadly, weakly convex; angles rounded. SCUTELLUM: slightly wider than long, triangular, apex broadly rounded, not narrowed; apex about two-thirds of membranal suture; disc abundantly punctured. HEMELYTRON: corial areas well defined, moderately punctured over entire surface; costa with twenty or more setigerous punctures; membranal suture bisinuate; membrane about two-fifths of hemelytral length, milky hyaline. PROPLEURON: polished, impunctate; prosternal carinae low; anterior margin broadly and weakly lobed on either side of middle. MESOPLEURON: (Fig. 90) slightly concave, shining, evaporatorium absent, replaced by rough, close, oblique rugae on inner basal half; posterior margin entire; mesosternum carinate medially, with numerous long hairs. METAPLEURON: (Fig. 90a-d) rather convex, shining, evaporatorium restricted to simple outline of peritreme, remainder of surface shining, weakly rugose or with few punctures; peritreme reaching to or slightly past middle of segment; terminal modification strongly to weakly auriculate (Figs. 90a-d) but always with anterior part extended posteriorly around osteolar opening which is visible ventrally. LEGS: short; anterior tibia (Fig. 118) moderately dilated, with seven or eight stout, blunt spines on dorsal margin, not prolonged beyond tarsal insertion; tarsal II shortest; middle and posterior tibiae subterete, latter (Fig. 151) straight, equally spined dorsally and ventrally. STERNITES: convex, polished, wrinkled and punctured, each segment with transverse row of setigerous punctures approaching posterior margin at middle; each

segment laterally with submarginal band of close-set setigerous tubercles forming an elevated band which gives rise to more than twelve long hairs per segment.

GENOTYPE: Microporus obliquus Uhler (1872:394), monotypy.

DISTRIBUTION: The two members of this genus are known to occur throughout the entire United States, but only from scattered localities in the eastern half, and south to central Mexico.

DISCUSSION: The division of the genera of the Cydnidae into two groups based upon the absence or presence of a differentiated terminal part of the peritreme has proven to be very workable in nearly all cases. The "exception" proves to be in the present genus--Microporus. In the original description of Microporus, Uhler (loc. cit.) said, "Ostiolar canal short, at tip enlarged into a circular auricle." He described two species in this genus, obliquus, the genotype, and testudinatus. Several years later, Distant (1880:8), after quoting Uhler's statement concerning the the "circular auricle," described a third species, mexicanus. From all this one would assume that the circular auricle was a characteristic of all three forms. The first clue that such was not always the case appeared in Signoret's (1881b) introductory remarks concerning Uhler's genera. In the following year Signoret separated Uhler's two species and transferred obliquus to Cydnus (defined as having "a l'extremite du canal ostiolaire un lobe libre, plus ou moins sureleve, en forme de cornet et plus ou moins aplati sur les cotes,") and testudinatus to Aethus (defined as having "le canal ostiolare termine par un lobe de formes diverses, libre a l'extremite ou plus ou moins confondu avex la suture mesosternale"). From specimens which Uhler apparently furnished him, Signoret illustrated the greatly

reduced terminal modification of the osteolar peritreme in testudinatus and the auricular development of the same structure in obliquus. Since that time authors have treated these species as members of the genus Aethus or Cydnus depending on how the latter taxon was defined.

With the intense examinations of the present study the specimens assigned here again appeared to stand apart from all others in the Western Hemisphere. And again they appeared to be best defined as Uhler had done, but with a limiting statement concerning the shape of the terminal process of the peritreme. In the more than 200 specimens examined, the shape of the terminal process of the peritreme proved to be somewhat variable but exhibited two general types. The first type was large and loop-shaped with the osteole opening ventrally at its base (Fig. 90a). The second type showed more variability but was essentially the loop-shape greatly reduced and somewhat compressed, but still with the osteole opening ventrally at its base (Figs. 90b-d). The latter, or reduced type, was found almost exclusively on a series of specimens from the costal regions of central California (see distribution notes under testudinatus); while the loop-shaped type was found on specimens from all parts of the range of the genus, even in the central coastal area of California.

Additional support for keeping Microporus as a distinct genus is offered by several features other than the peritreme. First, the very limited metapleural evaporatorium appears unique and by itself could be relied upon to separate this genus from all others in the Western Hemisphere. The evaporatorium makes a narrow halo around the peritreme and does not extend posteriorly to the base of the metapleural lamella. Second, the general habitus of these insects is broadly to very broadly

oval, strongly convex above and beneath and with abundant, very long hairs along the sides of the pronotum and abdomen and on the costa. On the costa there are usually twenty or more long hairs arising from setigerous punctures. On the lateral submargin of each sternite there is a somewhat raised area that gives rise to about ten or more hairs. This latter character appears to be unique among the genera of the Western Hemisphere. The third diagnostic feature consists of a combination of two characters. These two characters are the complete submarginal row of pegs and hairs on the head and the unnarrowed apex of the scutellum which is broader than half the length of the membranal suture. The combination of these two characters is found in no other group of Neogaean Cydnidae except the brevis section of the genus Tominotus. Coupling these last two characters with the more rounded shapes and more numerous lateral hairs that are exhibited by each suggests that Microporus may be considered closely related to the brevis group, and perhaps form an offshoot from it.

With the genus thus tentatively established, attention must be directed to the three nominal species described within Microporus. At the specific level the student of this group is again beset by the same problem--exceeding variability of characters, even those that might be considered critical for separating species. Considering first Uhler's two species, obliquus and testudinatus, one gathers from the literature that an eastern and western species respectively are represented. Attempts to separate the two on the basis of published treatments led to confusion and uncertainty because obliquus shows such extreme variation that one is easily led to believe that but a single variable species is involved. The present author is not yet fully convinced otherwise, but simply retains the two forms because he

does not feel that sufficient evidence is at hand to synonymize a long-established name. Additional specimens, especially from California, should decide the matter. The separating character accepted in the present study is that furnished by the development of the terminal lobe of the peritreme. The large, loop- or ear-shaped lobe is accepted as the diagnosis for obliquus, while the reduced lobe marks the distinctness of testudinatus. If the gap would remain evident between these two extremes the two forms could be accepted as distinct. But as indicated by Figure 90b, it appears that with a larger series of specimens this gap will eventually be bridged.

If testudinatus is accepted as being delimited by the reduced peritreme lobe, it appears to be rather uniform in shape, punctation and coloration of the membrane. But all features for which testudinatus was examined fell within the great range of variability exhibited by obliquus (see specific discussion of variability for this form). The confusion caused by this variability also misled Uhler who labelled a specimen of obliquus as testudinatus. This specimen does show the proper habitus for testudinatus but has the loop-shaped lobe on the peritreme and a ventral truncation of the prosternal carinae and lacks the membranal markings. Recourse to the male gonostylus resulted in no help. In the more than twenty specimens examined, the gonostyli of no two were alike. The series of accompanying outline drawings (Figs. 197a and b and 198a-f) demonstrates some of the variability in the shape of this structure.

Distant's (1880:8) species, Microporus mexicanus, appears to be obliquus for two reasons. First, the generic characterization quoted Uhler's description of the "circular auricle," while the specific description said nothing about mexicanus disagreeing on this point (assuming

Distant verified the generic features occurring on the ventral surface of his specimens). Second, Distant made a comparison with obliquus but the differentiating features pointed out by him, the punctation and wrinkling of the scutellum, do not appear to have specific value in the group. In fact, transverse wrinkling appears to be a deformity that occurs often in specimens of this family; perhaps the burrowing of teneral specimens causes the still-plastic cuticula to be jammed into folds.

Therefore, at present the author recognizes two species in the genus and offers the following key for their separation:

Key to the Species of Microporus

1. Osteolar peritreme terminating in a large loop- or ear-shaped process (Fig. 90a). . . . . .obliquus Uhl. p. 102

Terminal lobe of osteolar peritreme smaller (Figs. 90b-d). . . . . .testudinatus Uhl. p. 106

Microporus obliquus Uhler (Fig. 8)

1872 Microporus obliquus Uhler, Fifth Ann. Rep. United States Geol. Surv. for 1871, p. 394.

1876 Microporus obliquus "loc. incert." Stal, Svenska Ak.-Handl.,14(4):27.

1877 Microporus obliquus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:373.

1880 Microporus mexicanus Distant, Biol. Centr.-Amer., Rhynchota, 1:8, tab. IV, fig. 8. NEW SYNONYMY.

1882 Cydnus obliquus Signoret, Ann. Soc. Ent. France, (6) 2:161, pl. 7, fig. 97.

1882 Microporus mexicanus Signoret, Ann. Soc. Ent. France, (6) 2:241.

1886 Cydnus obliquus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Microporus mexicanus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus obliquus Lethierry and Severin, Gen. Catal. Hemip., 1:67.

1893 Cydnus mexicanus Lethierry and Severin, Gen. Catal. Hemip., 1:67.

1910 Cydnus obliquus Banks, Catal. Nearct. Hemip., p. 99.

1917 Aethus obliquus Univ. California Pubs. Ent., 2:20.

1939 Aethus (Microporus) obliquus Torre Bueno, Ent. Amer., 19:179,

DIAGNOSIS: MALE:- broadly oval. HEAD: length more than two-thirds width, 0.84 (0.73-0.96): 1.13 (1.00-1.26); interocular width, 0.80 (0.71-0.91); anterior outline a flattened semicircle, juga slightly longer than clypeus; dorsum shining, with radiating rugae and few to many punctures; juga ventrally and maxillary plate polished, impunctate; antennals, I, 0.21 (0.20-0.23): II, 0.14 (0.11-0.18): III, 0.20 (0.19-0.23): IV, 0.20 (0.16-0.23): V, 0.22 (0.20-0.25); labium reaching bases of middle coxae, segments I, 0.39 (0.36-0.46): II, 0.50 (0.43-0.53): III, 0.38 (0.33-0.44): IV, 0.30 (0.26-0.36). PRONOTUM: length less than half width, 1.18 (0.99-1.32): 2.38 (2.11-2.69); anterior margin moderately, singly emarginate; lateral margin straight on basal two-thirds or more; lateral margin entire, not emarginate, with submarginal stripe of numerous setigerous punctures; transverse impression weak to absent, postmedian, without a row of coarser punctures; anterior lobe distinctly but variably punctate only subapically and laterally; posterior lobe sparsely and finely punctured to coarsely and closely punctured. SCUTELLUM: little wider than long, 1.58 (1.36-1.75): 1.45 (1.25-1.65); surface shining, feebly or not wrinkled, punctures sparse across narrow base, extending to apex. HEMELYTRON: clavus and corium obsoletely alutaceous; corium uniformly punctured over most of surface; costa with more than twenty-five setigerous punctures; membrane

slightly longer than basal width, immaculate or patterned, pattern consisting either of a median fuscous dot or median fuscous dot with apical half infuscated. PRO-, MESO- and METAPLEURAE: as in generic description, latter with lobe of peritreme loop- or ear-shaped, with osteole opening ventrally at its base (Fig. 90a); lateral area polished, usually with few scattered punctures mesally. LEGS: as in generic description. TERMINALIA: genital capsule distinctly punctate laterally, apical margin feebly sinuate either side of middle; gonostylus variable in shape (Figs. 198a-f). LENGTH of body, 3.98 (3.66-4.47).

FEMALE:- similar to male, measurements averaging larger. HEAD: length: width:: 0.92 (0.84-0.97): 1.23 (1.13-1.34); interocular width, 0.88 (0.80-0.95); antennals, I, 0.23 (0.21-0.26): II, 0.15 (0.13-0.17): III, 0.21 (0.20-0.24): IV, 0.21 (0.20-0.26): V, 0.22 (0.20-0.29); labials, I, 0.40 (0.37-0.43): II, 0.51 (0.50-0.53): III, 0.40 (0.37-0.44): IV, 0.33 (0.30-0.37). PRONOTUM: length: width:: 1.30 (1.21-1.49): 2.64 (2.43-2.93). SCUTELLUM: length: width:: 1.66 (1.49-1.82): 1.73 (1.61-1.89). LENGTH of body, 4.45 (4.04-5.01).

TYPE DATA: The type of obliquus is in the collection of the United States National Museum. The species was described from "Ogden, Utah."

DISTRIBUTION: As presently defined, this species ranges across the United States, from New York south to South Carolina west to the Pacific coast, and south into central Mexico.

DISCUSSION: The extreme variability exhibited by this species has been most confusing. This variability is evident on most parts of the body. The head may be weakly (Fig. 29) to strongly convex (Fig. 28) with the part within the submarginal row of setigerous punctures being abruptly

or gradually tumid; the surface may have weak to strong radiating rugae and may be virtually impunctate, with few scattered punctures or with crowded close punctures. The pronotum varies in degree of narrowing of the sides, in the number and size of punctures and in shape of prosternal carina which may (Fig. 29) or may not be truncated ventrally. The scutellum and hemelytra likewise vary in surface sculpture. The membrane may be immaculate or patterned as described above. The general shape may be from broadly oval to very broadly oval or almost rounded in outline. With such variability to evaluate, one wonders whether one or several species are involved here, and whether or not this species may actually encompass the form maintained in the present paper as testudinatus! With more time and material available for study the answer may become evident, but at present decisions are only tentative.

Reports by Hart (1919) and Stoner (1920) indicate that this species is normally an inhabitant of the roots of various plants growing in sandy areas. Notes on some of the specimens examined during this study confirm the sandy habitat with such remarks as "sand", "sand area" or "sand dune". Occasional specimens likewise bore a record of the plants with which they were associated, as follows: cantaloupe in Arizona, Amsinkia roots and Oenothera cheiranthefolia in California and Hudsonia in Virginia. Stoner (loc. cit.) gave additional notes on the habits of this species in Iowa, reporting that adults were present in spring and that nymphs outnumbered adults during the summer months. He reported an interesting observation in which specimens were seen to be clutching a seed against the body with the middle legs.

SPECIMENS STUDIED: 70 males, 118 females. UNITED STATES: Arizona: Chiso Valley, Phoenix, Tuba City, Winslow, St. Johns; July, August. California: Altamont, Amadee, Anaheim, Antioch, Burlingame, Davis Co., Fairfax, Lagunitas, mts. w. of LaPanza, Los Angeles, Manhattan Beach, Modesto, Pasadena, Pt. Arena, Plumas Co., 3 mi. s. Olancho, Rio Vista, River side, Seal Beach, Sequoia Nat. Park, Truckee; March to September. Colorado: Colo. Springs, Denver, Ft. Collins, Fountain Valley, Manitou, Power Co.; June, August. Idaho: Hansen, Murtaugh, Twin Falls; May and June. Illinois: Havana, Oregon; May, June. Indiana: Pine; May. Iowa: Iowa City, Lake Okoboji; May to September. Kansas: Clark Co., Dodge City. Louisiana: Bassier; February. Missouri: St. Louis; June. Nevada: Humboldt L.; August. New Mexico: Albuquerque, Scholle, Estancia, Torrance Co., Tucumcari, Vaughn, Willard; June to September. Oklahoma: Alva, Stillwater; April, May. Oregon: The Dalles, Umatilla; May, June. South Carolina: Charleston; March. South Dakota: Chester, Hecla; June. Texas: Amarillo, Austin, Katherine, Sommerset, Tyler, Uvalde, Valentine; February to June, September to December. Utah: Provo; June. Virginia: Cape Henry; June. Washington: Vantage; April. MEXICO: Coahuila: Torreon. Durango: Durango. Guanajuata: Gazales Jct. Hidalgo: Zimapan; November. Sonora: Guaymas.

Microporus testudinatus Uhler

1876 Microporus testudinatus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 1:276.

1877 Microporus testudinatus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:374.

1880 Microporus testudinatus Distant, Biol. Centr.-Amer., Rhynchota, 1:8, tab. 2, fig. 24.

1882 Aethus (Microporus) testudinatus Signoret, Ann. Soc. Ent. France, (6) 1:424, pl. 11, fig. 53.

1886 Microporus testudinatus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Aethus testudinatus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus testudinatus Lethierry and Severin, Gen. Catal. Hemip., 1:68.

1917 Aethus testudinatus VanDuzee, Univ. California Pubs. Ent., 2:20.

1939 Aethus (Microporus) testudinatus Torre Bueno, Ent. Amer., 19:179.

DIAGNOSIS: The small size of the apical lobe of the peritreme separates this species from the other member of the genus.

DESCRIPTION: MALE:- broadly to very broadly oval. HEAD: length about two-thirds width, 0.82 (0.80-0.83): 1.14 (1.13-1.16); interocular width, 0.85 (0.83-0.90); anterior outline a strongly flattened semicircle, juga slightly longer than clypeus; surface shining, feebly rugose, with small punctures, somewhat tumid just mesad of submarginal row of punctures; juga ventrally and maxillary plate impunctate; antennals, I, 0.26 (0.24-0.28): II, 0.14 (0.13-0.16): III, 0.19 (0.19-0.20): IV, 0.20 (0.20-0.20): V, 0.20 (0.20-0.20); bucculae slightly lower than labial II, evanescant posteriorly; labium reaching between middle coxae, segments, I, 0.41 (0.40-0.43): II, 0.52 (0.48-0.56): III, 0.41 (0.40-0.44): IV, 0.28 (0.26-0.30). PRONOTUM: length less than half of width, 1.15 (1.14-1.17): 2.47 (2.40-2.55); anterior margin deeply and singly emarginate; lateral margins entire, not emarginate, submarginal setigerous punctures very numerous, arranged in a narrow stripe (not in a single row); transverse groove behind middle, absent medially and faintly indicated laterally; anterior lobe distinctly punctured only subapically and laterally; posterior lobe punctured, finely so on disc and more coarsely so laterally. SCUTELLUM: wider than long, 1.66 (1.56-1.82):

1.52 (1.49-1.56); surface shining, feebly transversely wrinkled, punctures absent at base and becoming progressively coarser and much more numerous to apex. HEMELYTRON: corium distinctly convex, areas well defined; disc with a single, sunken row of close-set punctures paralleling claval suture, elsewhere sparsely punctured; exocorium more densely punctured; costa with some twenty-five or more setigerous punctures; clavus with two longitudinal rows of punctures; membranal suture almost straight, rectangular at outer angle; membrane usually short, about as long as basal width. PROPLEURON: impunctate; prosternal carinae very low, thick, evanescent ventrally. MESOPLEURON: lateral area sparsely rugo-punctate. METAPLEURON: osteolar peritreme reaching half way across segment, terminal process variable (Figs. 90b-d), curved into small auricle with osteole opening ventrally at base, antero-apical angle prolonged along mesosternal suture as evanescent projection; lateral area polished, with a number of obsolete to strong punctures. LEGS: as in generic description. TERMINALIA: genital capsule distinctly punctate laterally, margin slightly flaring, apical margin weakly sinuate either side of middle; gonostylus variable in shape (Figs. 197a and b). LENGTH of body, 3.94 (3.85-4.04).

FEMALE:- very similar to male, but measurements averaging larger. HEAD: length: width:: 0.87 (0.83-0.90): 1.21 (1.16-1.28); interocular width, 0.91 (0.86-0.96); antennals, I, 0.24 (0.23-0.26): II, 0.15 (0.14-0.16): III, 0.20 (0.20-0.21): IV, 0.20 (0.20-0.21); labials, I, 0.42 (0.41-0.43): II, 0.56 (0.53-0.63): III, 0.43 (0.43-0.46): IV, 0.34 (0.33-0.36). PRONOTUM: length: width:: 1.24 (1.17-1.36): 2.67 (2.53-2.86). SCUTELLUM: length: width:: 1.65 (1.56-1.82): 1.80 (1.75-1.89). LENGTH of body, 4.25 (4.14-4.40).

TYPE DATA: The type specimen is in the collection of the United States National Museum, vide Sailer (1952). Several specimens of the present study have been compared with the type by Dr. R. I. Sailer of that institution. The type locality given by Uhler (loc. cit.) was "California".

DISTRIBUTION: Nearly all specimens studied had come from the coastal counties of California near San Francisco, from Sonoma to Monterey counties. Two other localities were represented: "S. W. Mex.," which may represent a coastal area, and "Plumas Co." in the eastern part of the northern third of California. Confirmation of this latter locality record is particularly desirable.

DISCUSSION: All named California specimens of Microporus that were studied bore the determination of testudinatus, suggesting that locality rather than morphology was used as the delimiting factor, especially as none of the specimens from outside of California bore that determination. The Mexican specimen cited above was from the Uhler collection in the United States National Museum and may have been the one on which he based the Mexican locality in his "Monograph." All other Mexican specimens examined during this study belonged to obliquus.

SPECIMENS STUDIED: 13 males, 20 females. UNITED STATES: California: Asilomar, Carmel, Dillon Beach (Marin Co.), Monterey Co., Pacific Grove, Pt. Arena, San Francisco, Santa Cruz, Sea Side, Sonoma Co.; February, April to September. MEXICO: "S. W. Mex."

Genus Cydnus[1] Fabricius

1803 Cydnus Fabricius, Syst. Rhyng., p. 184.

1843 Brachypelta Amyot and Serville, Hist. Nat. Hemip., p. 89.

DIAGNOSIS: Among the cydnid genera occurring in the Western Hemisphere, this one may be recognized by being large (more than nine millimeters in length of body), black and having the membranal suture very strongly bisinuate (Fig. 4).

DESCRIPTION: Size large, shape elongate oval, sides subparallel; dorsum weakly convex, venter strongly so. HEAD: length more than three-fourths of width; margins broadly expanded, eyes faintly or not at all projecting; juga greatly surpassing clypeus, broadly contiguous beyond it and very strongly elevated anteriorly; submarginal row of setigerous punctures on each jugum far removed from margin; clypeus with two subapical setigerous punctures; ocelli small, behind a line connecting posterior margins of eyes and separated from eyes by a space about two or more times a transverse ocellar width; juga ventrally roughened by weak rugae and weaker punctures; maxillary plate with irregularly spaced, fine tubercles; antennae five-segmented, I shortest, II and IV subequal, longer than III or V; bucculae (Fig. 21) very high, posterior end highest and abruptly, perpendicularly truncated; labium reaching onto mesosternum, I shortest, II and III usually subequal, longer than IV. PRONOTUM: length a little more than half

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[1]Pending completion of studies of the Cydnidae of the Eastern Hemisphere, the conclusions of China (1943) concerning this genus are here accepted without question. The decision to do this was a practical solution to a complex problem requiring review of a very extensive literature of a genus which apparently is not yet established in this hemisphere.

of width; anterior margin weakly emarginate; lateral margins carinate, weakly converging from base to apical third, thence broadly rounded to anterior angles; posterior margin nearly straight across width of scutellum, then depressed and slightly lobulate before curving obliquely forward laterally; all angles rounded; transverse impression submedian, broad and shallow; anterior lobe of male strongly inflated across middle three-fifths of posterior third, thence abruptly declivitous to anterior margin; anterior lobe of female without such elevation; posterior lobe in both sexes only slightly convex. SCUTELLUM: a broad, short, triangle, base and side margins subequal in length; sides strongly and abruptly declivitous, virtually perpendicular on basal half or more; apex narrowed, acute. HEMELYTRON: corial area, except costa, well defined; membranal suture distinctly bisinuate, sinuation accentuated by black basal margin of milky membrane; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: convexities and depression with numerous close-set small tubercles and some closely associated punctures; prosternal carinae low, thick, obscured by heavy punctation; anterior margin very weakly expanded either side of middle. MESOPLEURON: surface irregular, strongly impressed laterally; evaporatorium limited; lateral area coarsely rugo-punctate; mesosternum somewhat swollen, carinate along midline, with numerous long hairs. METAPLEURON: weakly convex; terminal process of peritreme large, elongate-oval, surface alutaceous but shining, with one to three longitudinal or oblique sharp rugae (Fig. 89); evaporatorium extensive, distinctly surpassing apex of peritreme and reaching almost to posterior coxa; lateral area with mumerous coarse, rugose punctures. LEGS: moderately long; anterior tibia (Fig. 116) not surpassing tarsal insertion, strongly compressed, dorsal

margin with eleven spines; middle and posterior (Fig. 139) legs with tibia terete; tarsal II little shorter than I, III longest. STERNITES: strongly convex, punctured, laterally more coarsely punctured and with numerous small tubercles; posterior margin of each segment finely denticulate or crenulate. TERMINALIA: male genital capsule opening dorsally, apical rim feebly flared.

GENOTYPE: Cydnus tristis Fabricius (1803:185), by subsequent designation by Blanchard (1844:505) (vide China, 1943:220); Fabricius' name is a synonym of Cimex aterrimus Forster (1771:71). The genotype of Brachypelta is Cydnus tristis Fabricius (loc. cit.), monobasic. Thus, because Brachypelta has the same genotype as does Cydnus, it is a synonym by isogenotypy.

DISTRIBUTION: The single species of the genus Cydnus is a palearctic form which, according to Oshanin (1912), occurs in all the major zoogeographical regions of the Old World. The present records of it in the New World probably represent introductions rather than a part of the permanent range.

DISCUSSION: The occurrence of the single species of this genus in the Western Hemisphere came as a surprise. Although the author prefers to consider these records as accidental introductions and not indications of established population, he believes that if the latter does prove to be true this information will be useful.

Cydnus aterrimus (Forster) (Fig. 4)

1771 Cimex aterrimus Forster, Nov. Sp. Ins., p. 71.

1775 Cimex tristis Fabricius, Syst. Ent., 4:124.

DIAGNOSIS: This is the only species known to belong to the genus Cydnus.

DESCRIPTION: (based on two males) MALE:- elongate oval, sides parallel. HEAD: length four-fifths width, 1.71 (1.63-1.79): 2.02 (1.36-1.50); inter-ocular width, 1.43 (1.36-1.50); anterior outline more than a semicircle, broadly V-emarginate at apex; juga much surpassing and broadly contiguous beyond apex of clypeus; surface concave, mostly shallowly rugo-punctate; jugum with six submarginal setigerous punctures; jugum ventrally and maxillary plate weakly to strongly rugo-punctate; antennals, I, 0.48 (0.47-0.50): II, 0.80 (0.78-0.83): III, 0.68 (0.66-0.70): IV, 0.83 (0.83-??): V, 0.90 (0.90-??); labium reaching base of mesosternum, segments, I, 0.53 (0.53-0.53): II, 0.91 (0.90-0.93): III, 0.91 (0.90-0.93): IV, 0.56 (0.53-0.60). PRONOTUM: length more than half width, 3.11 (3.03-3.20): 5.51 (5.44-5.59); laterally with submarginal row of ten to twelve setigerous punctures; transverse impression median, shallow, broad and distinct, without a row of coarser punctures; anterior lobe elevated anterior to transverse impression, thence abruptly declivitous to apex in middle third, broad anterior and lateral margins closely and moderately punctate; posterior lobe laterally with continuation of punctation of anterior lobe, discally (especially in transverse impression) with numerous intermixed moderate and minute punctures and fine longitudinal rugulae. SCUTELLUM: length about two-thirds width, 2.64 (2.60-2.69): 3.60 (2.56-2.65); surface, except oblique area in basal angles, with crowded intermixed moderate and minute punctures and fine longitudinal rugulae. HEMELYTRON: clavus and corium alutaceous; clavus with two very irregular rows of punctures; mesocorium with crowded small punctures, some arranged in two more or less distinct rows paralleling claval suture; exocorium more densely punctate than mesocorium; costa without setigerous punctures. Remainder as in generic description.

TERMINALIA: gonostylus as illustrated (Fig. 200). LENGTH of body, 11.25 (10.90-11.63).

TYPE DATA: The type, which was described from "Hispania ad fretum Gaditanum," has not yet been located.

DISTRIBUTION: see same topic under genus heading.

DISCUSSION: The occurrence of this species in the New World was not suspected by the author. However, since it is such a common species around many ports of Europe and other parts of the Old World there appears no reason to doubt that adults could easily fly to lights on the boats and unwittingly accompany the vessels anywhere in the world. At present the author prefers to consider these records as accidental introductions and not representatives of established populations. But perhaps additional collecting in these areas will prove otherwise, in which case the included data will be helpful.

Comparison of these two specimens with material from the Mediterranean area leaves no doubt about the identity of them. The females, however, differ from the males in that the anterior lobe of their pronotum is low and gently convex, not elevated and declivitous as in the males.

SPECIMENS EXAMINED: 2 males. "Ala.?" (HMH). "West Indies: Tobago. 1-4, ii, 1931. Capt. A. K. Totton. B. M. 1931-183," (BrM).

Genus *Ectinopus* Dallas

1851 *Ectinopus* Dallas, List. Hemip. Brit. Mus., 1:121.

DIAGNOSIS: The large, blackish membrane which occupies about one-half of the hemelytral length permits ready recognition of this genus.

DESCRIPTION: Large (11.3-14.2), elongate oval, greatest width

approximately at midlength; dorsum slightly convex, venter much more strongly so,body surface dorsally and ventrally and corium distinctly alutaceous. HEAD: length more than half of width, flattened above; clypeus as long as juga; latter with anterior margin nearly or quite semicircular, not or vaguely relaxed at edge, without submarginal row of setigerous punctures; eyes large, entire, slightly projecting; ocelli well-developed, moderate in size situated on a line connecting hind margins of eyes, separated from eyes by about twice an ocellar width; with two primary setigerous punctures, one near inner angle of eye, one subapically on jugum (Fig. 66); antennae five-segmented, I shortest, V usually longest; bucculae moderately high, reaching almost to base of head; labium reaching between or slightly beyond middle coxae, IV shortest, II longest, slightly compressed and without a foliaceous lobe, III longer than I (Fig. 22). PRONOTUM: nearly twice as broad as long, narrowed anteriorly, side margins carinate, slightly coarctate, with sub-marginal row of five to seven setigerous punctures; transverse impression slightly post median, weak or obsolete, variously punctured; front margin shallowly and evenly concave; posterior margin slightly and broadly convex; all angles rounded. SCUTELLUM: as wide as, or slightly wider than long, strongly triangular; apex narrowed, acute, sides flattened; disc more or less punctured; width of apex about one-third of membranal suture. HEMELYTRON: corial areas well defined; membranal suture straight, lateral angle acutely prolonged; corium with rather uniform, scattered punctures, these a little denser on exocorium; costal margin usually with a single sub-basal setigerous puncture; membrane about half the hemelytral length, translucent brownish-black. PROPLEURON: depression moderately punctate; prosternal carinae low, rounded; anterior margin of prosternum with a broad,

short lobe either side. MESOPLEURON: (Figs. 100 and 101) flat, with a strong, oblique, rugo-punctate groove anterior to evaporatorium; latter extensive, reaching to postero-lateral angle; posterior margin crenulate; mesosternum prominent and subcarinate along midline, with numerous hairs on apical half. METAPLEURON: (Figs. 100 and 101) nearly flat, evaporatorium occupying mesal two-thirds of segment; lateral polished area punctate near evaporatorium; osteolar peritreme extending less than half way across segment; anterior part of peritreme curved posteriorly around osteolar opening which is visible ventrally (Figs. 100 and 101), posterior apex narrowly polished. LEGS: long, slender; anterior tibia (Fig. 126) only moderately widened, eight to nine stout, sharp spines dorsally, apex not prolonged beyond tarsal insertion; middle and hind tibiae slender, latter (Fig. 145) about half as long as body, slightly curved in apical half, margins uniformly spined. STERNITES: strongly convex; each segment with a broad, lateral area of shallow punctures; segment VI sometimes modified medially on posterior margin in females (see "discussion" below). TERMINALIA: male genital capsule very broadly, shallowly emarginate; ventral plates of female convex, flat or concave, sternite VI variously or not modified (Figs. 182 and 183).

Three fifth instar nymphs were available for study. These showed the sparse lateral setigerous punctures of the head and body, and the long, terete, posterior tibia of the adult. They differed from adults in possessing a weak, submarginal primary setigerous anterior to the eye. In color they were quite striking. The head, thorax and appendages were the usual brownish-black color, but the abdomen was very bright red with the dorsal and lateral plates black. The eyes, also, were brilliant red.

GENOTYPE: Cydnus holomelas Burmeister (1835), monobasic.

DISTRIBUTION: The general range of Ectinopus extends from Mexico south to Bolivia and Brazil.

DISCUSSION: The three species of this genus are structurally very similar, allowing most of the physical features to be incorporated into the generic description. One structural feature, however, merits additional comment: the modification of the sixth sternite which occurs in the females. This modification of the middle of the posterior margin of the segment forms a progressive series from no modification in opacus, through a polished, flattened, transverse area in rugoscutum (Fig. 183) to a deep excavation between a pair of prominent, blunt tubercles in holomelas (Fig. 182).

Key to the Known Species of Ectinopus

1. Head with numerous (fifteen or more) punctures on either side anterior to ocelli; scutellum strongly punctured into basal fourth, sunken punctures of disk confluent transversely, forming transverse rugae (Fig. 66) . . . . . rugoscutum Sign. p. 120

   Head impunctate or with a very few scattered, very fine punctures; scutellum virtually devoid of punctures in tumid basal fourth 2

2. Osteolar peritreme extended laterally by a distinctly impressed, crenulate line (Fig. 101). . . . . opacus Dist. p. 122

   Osteolar peritreme without such an extending impressed line . . . . . holomelas (Burm.) p. 118

Ectinopus holomelas (Burmeister) (Fig. 15)

1835 Cydnus holomelas Burmeister, Handb. Ent., 2:375.

1851 Ectinopus holomelas Dallas, List Hemip. Brit. Mus., 1:122.

1862 Ectinopus holomelas Stal, Stett. Ent. Zeit., 1862:96.

1867 Aethus fusiformis Walker, Catal. Heterop.-Hemip. Brit. Mus., 1:150.

1867 Ectinopus holomelas Walker, Catal. Heterop.-Hemip. Brit. Mus., 1:164.

1876 Ectinopus holomelas Stal, Svenska Vet.-Akad. Handl., 14(4):20.

1877 Pangaeus ? fusiformis Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:389.

1880 Ectinopus holomelas Distant, Biol. Centr.-Amer., Rhynchota, 1:8.

1881 Ectinopus holomelas Signoret, Ann. Soc. Ent. France, (6) 1:320, pl. 10, fig. 42.

1886 Ectinopus holomelas Uhler, Checklist Hemip. N. Am., p. 3.

1893 Ectinopus holomelas Lethierry and Severin, Gen. Catal. Hemip., p. 64.

DIAGNOSIS: This species may be differentiated from its congenitors by the lack of punctures on the basal fourth of the scutellum plus the lack of an impressed line extending laterally from apex of peritreme.

DESCRIPTION: MALE:- HEAD: length more than half of width, 1.81 (1.69-1.98): 2.62 (2.57-2.93); interocular width, 1.63 (1.49-1.69); anterior outline a shallow semicircle; surface impunctate, with a few radiating rugae submarginally; antennals, I, 0.49 (0.46-0.56): II, 0.88 (0.80-0.97); III, 0.71 (0.66-0.90): IV, 1.27 (1.13-1.33): V, 1.41 (1.20-1.60); labials I, 1.01 (0.86-1.23): II, 1.39 (1.23-1.60): III, 1.19 (1.10-1.30): IV, 0.89 (0.83-0.96). PRONOTUM: length slightly more than half of width, 3.25 (2.87-3.44): 6.14 (5.72-6.49); transverse impression with an irregular band of a few, mostly widely-separated punctures; anterior lobe with or

without a series of punctures paralleling anterior emargination and with numerous crowded punctures laterally. SCUTELLUM: usually wider than long, 3.99 (3.76-4.20): 3.81 (3.45-4.05); discally with a scattering of a few punctures often present almost to apex. PROPLEURON and MESOPLEURON: as in generic description. METAPLEURON: as in generic description (Fig. 100), without an impressed line extending laterally from apex of peritreme. TERMINALIA: genital capsule alutaceous, with few scattered, weak punctures, apical margin not or only weakly sinuate; gonostylus as illustrated (Fig. 201). LENGTH of body, 12.38 (11.38-13.35).

FEMALE:- similar to male but posterior margin of sternite VI with a marked impression between two bluntly conical protuberances; measurements rather similar to those of male: HEAD: length: width:: 1.81 (1.75-1.84): 2.72 (2.60-2.86); interocular width, 1.57 (1.49-1.62); antennals, I, 0.49 (0.43-0.53): II, 0.88 (0.83-0.96): III, 0.81 (0.73-0.85): IV, 1.28 (1.16-1.33): V, 1.33 (1.16-1.46); labials, I, 1.09 (0.96-1.20); II, 1.42 (1.26-1.50): III, 1.21 (1.03-1.30): IV, 0.89 (0.80-0.96). PRONOTUM: length: width:: 3.15 (2.99-3.45): 6.11 (5.86-6.65). SCUTELLUM: usually longer than wide, 3.87 (3.60-4.34): 3.80 (3.73-4.05). TERMINALIA: ventral genital plates mostly convex. LENGTH of body, 12.71 (11.78-13.36).

TYPE DATA: The location of the type of holomelas, which was described "von Para," Brazil, by Burmeister (loc. cit.) is unknown to the author. The type of Walker's (loc. cit.) species was described from "Orizaba," Mexico, and is in the collection of the British Museum of Natural History.

DISTRIBUTION: Records at hand showed this species to occupy a range from central Mexico south to Bolivia in central South America.

DISCUSSION: Aethus fusiformis Walker has previously been assigned to synonymy here by Distant (1880 and 1899) and Signoret (1881), both of whom had examined the type in the British Museum.

SPECIMENS STUDIED: 21 males, 18 females, 3 nymphs. MEXICO: Isth. of Tehuantepec (labelled Pangaeus margo). Nayarit: Tepic; March. Sinaloa: Mazatlan; January. PANAMA: Alhajuelo; May. Barro Colorado; January. Boquete; March, June. Bugaba. COLOMBIA: Muzo, Dept. Boyaca; July. BOLIVIA: 50 mi. N. E. Cochabamba; August.

Ectinopus rugoscutum Signoret

1881 Ectinopus rugoscutum Signoret, Ann. Soc. Ent. France, 1881:319, pl. 10, fig. 41.

1893 Ectinopus rugoscutum Lethierry and Severin, Gen. Catal. Hemip., 1:64.

DIAGNOSIS: The numerous punctures on either side of the disc of the head and the coarsely punctured, transversely rugose scutellum will separate this species from the other two in the genus.

DESCRIPTION: MALE:- HEAD: length more than half of width, 1.93 (1.75-2.08): 2.83 (2.73-2.99); interocular width, 1.56 (1.49-1.66); anterior outline semicircular; surface of juga with moderate radiating rugae, with numerous (15 or more) fine punctures anterior to ocelli; antennals, I, 0.57 (0.53-0.63): II, 0.90 (0.83-0.96): III, 0.88 (0.80-0.94): IV, 1.32 (1.26-1.40): V, 1.48 (1.43-1.54); labials, I, 1.24 (1.16-1.36): II, 2.04 (1.66-2.26): III, 1.77 (1.46-1.89): IV, 1.16 (1.03-1.20). PRONOTUM: length slightly more than half of width, 3.20 (3.15-3.33): 6.39 (6.23-6.75); transverse impression with numerous crowded, coarse, sunken punctures, anterior lobe with a curved band of numerous punctures paralleling

anterior emargination; both lobes laterally with abundant, crowded punctures. SCUTELLUM: wider than long, 4.10 (4.00-4.33): 3.87 (3.83-3.91); with numerous punctures from base to near apex, these irregularly crowded, forming transverse rugae between them. PROPLEURON and MESOPLEURON: as in generic description. METAPLEURON: as in generic description, without impressed line extending laterally from apex of peritreme. TERMINALIA: genital capsule feebly alutaceous, with few distinct punctures laterally, apical margin broadly and shallowly U- or V-emarginate; gonostylus as illustrated (Fig. 202). LENGTH of body, 13.08 (12.57-14.03).

FEMALE:- similar to male but posterior margin of sternite VI with a shining subapical, transverse flattened area (Fig. 183) and measurements usually averaging distinctly larger than those of male: HEAD: length: width:: 2.02 (1.95-2.05): 2.99 (2.95-3.08); interocular width, 1.64 (1.62-1.69); antennals, I, 0.55 (0.42-0.63): II, 0.97 (0.93-1.01): III, 0.93 (0.87-1.00): IV, 1.41 (1.33-1.56): V, 1.53 (1.50-1.58); labials, I, 1.23 (1.16-1.32): II, 2.16 (2.00-2.23): III, 1.85 (1.60-2.16): IV, 1.23 (1.16-1.36). PRONOTUM: length: width:: 3.49 (3.33-3.61): 6.80 (6.30-7.09). SCUTELLUM: length and width subequal, 4.27 (4.08-4.35): 4.28 (4.06-4.35). TERMINALIA: ventral genital plates flat to gently concave. LENGTH of body, 13.83 (13.41-14.23).

TYPE DATA: The type of this species has not been located by the author. Signoret (loc. cit.) wrote that it came from "Amazone (Bresil)."

DISTRIBUTION: The present insect is known to occur in Brazil, Peru and Bolivia. It apparently occupies a more southern range than do the other two species of the genus.

DISCUSSION: no comments.

SPECIMENS STUDIED: 20 males, 25 females. BRAZIL: Teffe, P. R. Uhler Collection, 2m (USNM); same locality, Raulin, Thayer Exped. 11m, 21f (MCZ). Santarem, May 1919, S. M. Klages, Acc. 6324. 3m, 1f (Car). Villa Brage, XII, 1919, 1m (Car). PERU: Rio Maranon, 18-13-24, F 6029, H. Bassler collection, Acc. 33591. 1f (AmM). Iquitos, March, 1920, H. S. Parsh, collector. 1f (USNM). BOLIVIA: Ivon Beni, W. M. Mann, February, Mulford Bio. Expl. 1921-22. 1m (USNM).

Ectinopus opacus Distant

1900 Ectinopus opacus Distant, Trans. Ent. Soc. London, 9:688.

DIAGNOSIS: The oblique, crenulated, impressed line extending laterally from apex of the osteolar peritreme (Fig. 101) sets this species apart from the other two in the genus.

DESCRIPTION: (based on a single female): FEMALE:- HEAD: length more than half of width, 1.82: 2.73; interocular width, 1.56; anterior outline subquadrate; surface impunctate, with a few moderate oblique rugae; antennals, I, 0.50: II, 1.66: III, 1.33: IV, 0.76. PRONOTUM: length more than half of width, 3.28: 6.14; transverse impression with several widely separated punctures; in a broad, irregular band; rest of surface virtually impunctate except for about a dozen punctures laterally on anterior lobe. SCUTELLUM: length and width equal, 3.85: 3.85; surface with several well separated distinct, moderate punctures; apex impunctate. PROPLEURON and MESOPLEURON: as in generic description. METAPLEURON: as in generic description, except that a deeply impressed, oblique, crenulated line extends laterally from apex of peritreme (Fig. 101). STERNITES: VI unmodified along posterior margin. TERMINALIA: ventral genital plates distinctly concave. LENGTH of

body, 12.75.

TYPE DATA: The type of this species was reported by Distant (loc. cit.) as coming from "Costa Rica, Helechales."

DISTRIBUTION: The lone specimen studied was from Guatemala. Both this and the type locality are in central part of Central America, suggesting that possibly this species is very limited in distribution.

DISCUSSION: The original description does not enable one to separate this from rugoscutum structurally. In fact, the author earlier considered the two synonymous, with only the type locality of the present species offering a dissenting fact. Rugoscutum is known only from continental South America so the Central American locality for opacus presented a problem. The lone female studied, however, is intermediate between holomelas and rugoscutum in punctation and could easily account for Distant's comparative terms in relation to holomelas. Why he did not mention rugoscutum which Signoret separated from holomelas in virtually the same words is not clear but the very short third antennal segment which is less than three-fourths (70%) as long as the second and the lack of modification of the posterior part of the sixth sternite of the female each offer a character to separate this species from the others.

SPECIMENS STUDIED: GUATEMALA: Bobas, May 1924, W. M. Mann. 1f (USNM).

Genus Onalips Signoret

1881 Onalips (in part[1]) Signoret, Ann. Soc. Ent. France, 1881:323.

DIAGNOSIS: The free, foliaceous, truncated auricle with the osteole opening ventrally at its base (Fig. 95) marks the species of this genus from all others in the Western Hemisphere.

DESCRIPTION: Large, elongate-oval, widest posterior to midlength; dorsum weakly convex in male, more strongly so in female, venter strongly convex. HEAD: width less than twice length; surface flattened or noticeably convex; juga as long as or longer than clypeus and contiguous beyond it; anterior outline forming a flattened semicircle, with marginal dorsal carina and complete (including clypeus) submarginal row of coarse, setigerous punctures giving rise to long and short tapering cilia (no blunt, peg-like cilia except by breakage of the others); eyes large, entire, little projecting; ocelli well-developed, small, situated posterior to a line connecting hind margins of eyes, separated from eyes by more than twice an ocellar width; antennae five-segmented, II shortest, V longest; bucculae very high, reaching almost to base of head, terminated abruptly posteriorly; labium reaching between middle coxae, II or III longest, I

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[1]Originally described for two species, Aethus nigerrimus Dallas (1851) and Onalips cribratus new species. Examination proves that these two are not congeneric. Therefore Onalips is here restricted by designating the older of the two originally included species, Aethus nigerrimus Dallas (1851), as genotype. Signoret's species apparently fits in no other described genus and will require the erection of a new genus for it. Pseudonalips new genus, Onalips cribratus Signoret (1881:324) genotype, easily known as a member of the Cydninae by the trichobothrial arrangement, this new genus separates from all others of the subfamily by the nature of the apex of the peritreme which is undifferentiated but outlined posteriorly and laterally by the expanded and curved postero-subapical process (Fig. 112).

usually shortest, II compressed but without a foliaceous, semicircular lobe (Fig. 31). PRONOTUM: length half or more of width; widest at or distinctly in front of base; sides more abruptly incurved near apical third, carinate, with submarginal row of eight to twelve setigerous punctures; anterior margin moderately to deeply emarginate; posterior margin slightly convex; transverse impression weak to absent, median or post median in position; surface with few fine or several coarse punctures. SCUTELLUM: triangular, width versus length variable; apex narrowed, width about half length of membranal suture; disc impunctate or with coarse, sunken punctures. HEMELYTRON: corial area well defined; exocorium and usually mesocorium with numerous distinct punctures; costa with one to three setigerous punctures; membranal suture nearly straight, lateral angle rectangular; membrane dark brown to blackish, much less than half of hemelytral length. PROPLEURON: polished, weakly to coarsely punctured; prosternal carinae low but distinct; anterior margin expanded either side of middle. MESOPLEURON: flattened; evaporatorium extended uninterrupted into postero-lateral angle; posterior margin somewhat crenulate; mesosternum low, transversely convex, haired, partially carinate on midline. METAPLEURON: nearly flat; osteolar peritreme (Fig. 95) extended nearly half way across segment, terminate apically in a free-edged, truncated auricle with osteole opening at its base; evaporatorium occupying mesal two-thirds of segment, lateral margin oblique. LEGS: moderately long, stout; anterior tibia (Fig. 119) strongly compressed, eight to ten stout spines dorsally, not prolonged beyond tarsal insertion; middle and posterior tibiae sub-terete, latter (Fig. 147) straight or slightly curved, spines equally developed dorsally and ventrally; posterior femur with row of small tubercles on postero-ventral margin. STERNITES:

punctured laterally, polished medially; with or without lateral, submarginal setigerous tubercles.

GENOTYPE: Aethus nigerrimus Dallas (1851), here designated (see footnote on page 124).

DISTRIBUTION: The three species of this genus occur in a geographic area from Panama south to Paraguay and southern Brazil.

DISCUSSION: no comments required.

Key to the Known Species of Onalips[1]

1. Scutellum and pronotal transverse impression with widely-separated, coarse, sunken punctures (Fig. 7). .nigerrimus (Dall.) p. 130

   Scutellar and pronotal disks without coarse punctures. 2

2. Sixth sternite with lateral coarse punctures restricted to lateral, submarginal impressed part of abdomen (Fig. 181); male with apical rim of genital capsule entire (Fig. 181). .completus n.sp. p. 128

   Sixth sternite with lateral coarse punctures extending mesad and present on lateral third or more of segment (Fig. 180); male with apical rim of genital capsule convex either side of median emargination (Fig. 180). . . . . bisinuatus n.sp. p. 126

Onalips bisinuatus new species

DIAGNOSIS: The lack of discal punctures on both the pronotum and the scutellum plus the more extensive punctation of the sternites laterally will permit recognition of this species.

DESCRIPTION: MALE (from one specimen):- HEAD: length more than half

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[1] Onalips cribratus Signoret is not an Onalips, see footnote on page 124.

of width, 1.72: 2.73; interocular width, 1.65; anterior outline a strongly flattened semicircle, fine dorsal carina distinctly submarginal apically; juga surpassing and almost contiguous beyond apex of clypeus; surface with numerous, well-separated minute punctures and a few coarser ones on each jugum; antennals, I, 0.66: II, 0.56: III, 0.68: IV, 0.93: V, 1.18; labials, I, 0.96: II, 1.33: III, 1.20: IV, 1.00. PRONOTUM: length slightly more than half of width, 3.33: 6.44; lateral setigerous punctures eight to eleven in number; both lobes virtually impunctate except for a lateral, submarginal band of moderately coarse punctures. SCUTELLUM: length: width:: 3.66: 3.76; impunctate discally and apically. HEMELYTRON: shining, with abundant distinct punctures on exo- and mesocorium; costa with one setigerous puncture. PROPLEURON: with several moderately large, very shallow punctures on both convexities. MESOPLEURON AND METAPLEURON: as described for genus. STERNITES: shining, coarsely punctured on lateral third of V and VI; most segments without lateral submarginal setigerous tubercles. TERMINALIA: genital capsule coarsely and irregularly punctured except on medio-basal convexity; apical rim distinctly convex either side of small median emargination (Fig. 180); gonostylus as illustrated (Fig. 203). LENGTH of body, 11.46.

FEMALE (three specimens):- similar to male, measurements averaging larger; HEAD: length: width:: 2.02 (1.94-2.04): 3.08 (3.03-3.14); interocular width, 1.91 (1.92-1.93); antennals, I, 0.69 (0.67-0.70): II, 0.63 (0.63-0.64): III, 0.68 (0.65-0.71): IV and V missing from all specimens; labials, I, 1.04 (0.97-1.10): II, 1.43 (1.41-1.46): III, 1.46 (1.46-1.46): IV, 1.04 (1.04-1.04). PRONOTUM: length: width:: 3.96 (3.82-4.16): 7.16 (6.92-7.39). SCUTELLUM: length: width:: 4.32 (4.20-4.42): 4.42 (4.12-4.57).

LENGTH of body, 12.53 (12.18-12.75).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both labelled, "Santarem, Brazil, Acc. No. 2966," in collection of the Carnegie Museum. PARATYPES: one female labelled "Santarem, Brazil, April, 1919, S. M. Klages, Acc. 6324," and another female with the same data except that the month of capture reads "July," both in collection of the Carnegie Museum.

DISTRIBUTION: All studied material, the types listed above, was from Brazil.

DISCUSSION: This species and completus are closer to each other than to nigerrimus.

Onalips completus new species

DIAGNOSIS: The lack of discal punctations on both the pronotum and the scutellum plus the restricted punctation on the sternites marks this species from its congeners.

DESCRIPTION: MALE (two specimens):- HEAD: length more than half width, 1.59 (1.49-1.69); interocular width, 1.56 (1.56-1.56); anterior outline a moderately flattened semicircle, fine dorsal carina somewhat submarginal apically; juga as long as clypeus; surface with numerous, well-separated minute punctures and no coarser ones; antennals, I, 0.53 (0.53-0.53): II, 0.46 (0.46-0.46): 0.55 (0.50-0.60): IV, 0.68 (0.63-0.73): V, 0.88 (0.86-0.90); labials, I, 0.81 (0.80-0.83): II, 1.07 (1.05-1.10): III, 1.11 (1.00-1.23): IV, 0.88 (0.84-0.93). PRONOTUM: width twice or slightly more than twice length, 5.30 (5.26-5.34): 2.62 (2.62-2.62); lateral setigerous punctures eight to twelve in number; both lobes virtually impunctate except for lateral submarginal band of fine punctures. SCUTELLUM: length: width::

3.22 (3.22-3.22): 3,26 (3.22-3.30); impunctate discally and apically. HEMELYTRON: shining, exocorium with crowded distinct punctures; mesocorium with punctures becoming obsolete medially; costa with one setigerous puncture. PROPLEURON: with no punctures or only obsolete ones out of depression. MESOPLEURON and METAPLEURON: as described for genus. STERNITES: shining, with no punctures but a few moderate, longitudinal rugae mesad of sunken spiracular area; most segments usually without lateral, submarginal setigerous tubercles. TERMINALIA: male genital capsule impunctate except at extreme lateral edge, apical margin entire; gonostylus as illustrated (Fig. 204). LENGTH of body, 9.43 (9.30-9.57).

FEMALE (two specimens):- similar to male, measurements larger: HEAD: length: width:: 1.62 (1.56-1.69): 2.67 (2.53-2.82); interocular width, 1.72 (1.62-1.82); antennals, I, 0.58 (0.56-0.60): II, 0.46 (0.43-0.50): III, 0.56 (0.50-0.63): IV, 0.76 (0.70-0.83): V, 0.91 (0.90-0.93); labials, I, 1.00 (1.00-1.00): II, 1.28 (1.20-1.36): III, 1.28 (1.28-1.28): IV, 0.95 (0.90-1.00). PRONOTUM: length: width:: 3.33 (3.07-3.60): 6.21 (5.73-6.70). SCUTELLUM: length: width:: 3.82 (3.60-4.05): 3.98 (3.77-4.20). LENGTH of body, 11.11 (10.05-12.17).

TYPE DATA: HOLOTYPE, male, "Rurrenabaque, Rio Beni, Boliv., Oct., W. M. Mann, Mulford Biol. Expl., 1921-1922;" in collection of the United States National Museum; ALLOTYPE, female, "Mirim, Ceara, Brazil, Mann," in collection of the Museum of Comparative Zoology at Harvard. PARATYPES: one male, "Horqueta, Paraguay, 57-10, W. 23-24, N., 44 Kilm. East Paraguay Riv., XI-8, 1932, Albero Schulze," in collection of John C. Lutz; one female, "Chapada, Brazil, Acc. No. 2966, Sept.," in collection of Carnegie Museum.

DISTRIBUTION: As indicated among the type data, this species is known from Bolivia and Brazil.

DISCUSSION: This species and bisinuatus, also described as new, are much closer to each other than to nigerrimus.

Onalips nigerrimus (Dallas) (Fig. 7)

1851 Aethus nigerrimus Dallas, List. Hemip. British Mus., 1:112.

1867 Aethus nigerrimus Walker, Catal. Hemip. Brit. Mus., 1:152.

1876 Aethus nigerrimus Stal, Svenska Vet.-Ak. Handl., 14(4):25.

1881 Onalips nigerrimus Signoret, Ann. Soc. Ent. France, (6) 1:424, pl. 10, fig. 43.

1893 Onalips nigerrimus Lethierry and Severin, Gen. Catal. Hemip., 1:64.

DIAGNOSIS: The numerous, widely separated coarse punctures on the pronotum and scutellum readily separate this species from the other two.

DESCRIPTION: MALE:- HEAD: length more than half width, 1.60 (1.43-1.69): 2.65 (2.34-2.60); interocular width, 1.57 (1.49-1.62); anterior outline a flattened semicircle; juga surpassing clypeus and contiguous beyond it, with numerous irregularly-spaced coarse punctures, markedly tumid within submarginal row of setigerous punctures; interocellar space smooth; antennals, I, 0.59 (0.53-0.63): II, 0.50 (0.50-0.50): III, 0.63 (0.60-0.63): IV, 0.83 (0.80-0.86): V, 1.16 (1.10-1.20); labials, I, 0.94 (0.93-1.00): II, 1.20 (1.16-1.26): III, 1.20 (1.13-1.33): IV, 0.83 (0.83-0.86). PRONOTUM: length more than half of width, 3.05 (2.85-3.30): 5.59 (5.25-5.92); lateral setigerous punctures seven to eleven; transverse impression post median, with broad, irregular band of coarse, sunken punctures; anterior lobe punctured behind anterior emargination and laterally. SCUTELLUM: length and width subequal or one longer than the

other, length: width:: 3.30 (3.00-3.75): 3.26 (3.00-3.45); surface polished with numerous coarse, sunken punctures discally, these becoming finer apically. HEMELYTRON: usually distinctly duller than scutellum; abundantly punctured on exo- and mesocorium; costa with two to four setigerous punctures. PROPLEURON: with numerous coarse punctures on both convexities. MESOPLEURON and METAPLEURON: as described for genus. STERNITES: polished, with numerous coarse punctures on lateral third; some or all with one to three setigerous tubercles on lateral submargin. TERMINALIA: genital capsule shining, punctured laterally and at base, apical margin sinuate medially; gonostylus as illustrated (Fig. 205). LENGTH of body, 10.16 (9.21-10.95).

FEMALE:- very similar to male, measurements averaging larger: HEAD: length: width:: 1.77 (1.69-1.90): 2.61 (2.50-2.73); interocular width, 1.71 (1.69-1.75); antennals, I, 0.64 (0.63-0.66): II, 0.51 (0.50-0.56): III, 0.59 (0.53-0.63): IV, 0.81 (0.76-0.90): V, 1.10 (1.00-1.20); labials, I, 0.95 (0.86-1.00): II, 1.23 (1.16-1.30): III, 1.32 (1.26-1.40): IV, 0.84 (0.83-0.90). PRONOTUM: width: length:: 6.00 (5.77-6.45): 3.25 (2.85-3.60). SCUTELLUM: length: width:: 3.59 (3.45-3.75): 3.51 (3.30-3.75). LENGTH of body, 10.95 (10.20-11.70).

TYPE DATA: Dallas (loc. cit.) listed the type locality of this species as "Columbia [sic]." The type specimen is in the British Museum of Natural History.

DISTRIBUTION: The present insect is known only from Colombia and Panama.

DISCUSSION: A male in the Museum of Comparative Zoology collection bears the notation that it had been collected on "Cordia alliadora."

SPECIMENS STUDIED: 10 males, 6 females. PANAMA: Campana, IV-27, 1937, R. Bliss. 1f (JCL). Canal Zone: Ancon, #846, 8-6-24, W. M. Wheeler, Cordia alliadora. 1m (MCZ). Barro Colorado, V-1-26, VanTyne. 1m (MCZ). No locality other than Canal Zone Jan-Mar 44, Zetek, 5/22. 1m (USNM): Jan. Griswold coll. 1m (MCZ); VII-VIII-42, Jas. Zetek, No. 4985, 1f (USNM); 24-VI, 1924, N. Banks. 1f (MCZ). COLOMBIA: Monteria.

Genus Melanaethus Uhler NEW STATUS

1876 Melanaethus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 2:280.

1877 Lobonotus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:395 (nec Milne-Edwards 1863:282 in Crustacea).

1891 Lobolophus Bergroth, Rev. d'Ent., 10:235 (new name for Lobonotus Uhler).

"Geotomus" (part) authors, nec Mulsant and Rey, 1866, 324.

"Geocnethus" (part) authors, nec Horvath, 1919:245.

DIAGNOSIS: Among those genera in which the terminal lobe of the peritreme is developed into a short process, the members of this one may be recognized by its small size (3-6) and the more extensively developed metapleural evaporatorium (Figs. 96 and 97).

DESCRIPTION: small to moderately large, oval to elongate, greatest width across humeri or across hemelytra posterior to midlength; dorsum much less convex than venter. HEAD: as wide as or wider than long, flattened or slightly convex above; juga as long as clypeus, variously curved, usually with fine marginal carina dorsally; submargin with one setigerous puncture, except in planifrons which has three or four; eyes projecting by one-fourth to three-fourths their width; ocelli present, on or behind line connecting posterior margins of eyes; antennae five-segmented, I shortest, V usually longest, II, III and IV varying in

proportions; bucculae moderately to strongly elevated, highest posteriorly, posterior end usually abruptly terminated (Fig. 23); labium variable in length according to species, reaching from middle of mesosternum to basal segments of abdomen, II longest, slightly compressed, without foliaceous lobe. PRONOTUM: length usually not more than half width; lateral margins converging on anterior half or more, with not more than six setigerous punctures submarginally; transverse impression absent to well-developed and complete; posterior margin broadly and slightly curved or subtruncated; angles more or less rounded. SCUTELLUM: distinctly longer than broad, triangular, apex narrowed and less than half of membranal suture. HEMELYTRON: corial areas well-defined; membranal suture straight, convex or sinuate, not prolonged laterally; costa usually sharp, explanate and with no or very few setigerous punctures; membrane not over two-fifths of hemelytral length, sometimes brachypterous. PROPLEURON: moderately convex; convexities and depression rugose and/or punctate or smooth and impunctate; prosternal carinae prominent. MESOPLEURON: (Fig. 96) flattened, evaporatorium occupying half or more of segment, lateral margin strongly oblique, reaching near or into postero-lateral angle; posterior margin entire; mesosternum with prominent, distinct, median carina on basal half or more of nearly all species. METAPLEURON: (Figs. 96 and 97) flattened to uneven; evaporatorium occupying mesal two-thirds or three-fourths, lateral margin convex or straight and oblique; peritreme reaching or surpassing middle of segment, apical modification expanded posteriorly as semicircular, quadrate or triangular, more or less shining lobe, osteole usually opening posteriorly on peritreme. LEGS: moderately long, slender; anterior tibia (Fig. 120) moderately compressed, with four to seven long, slender to stout spines on

dorsal margin; middle and posterior tibiae terete, spines of latter (Fig. 144) subequally developed on all margins; tarsal II shortest, I shorter than III. STERNITES: strongly convex, shining or alutaceous, with or without setigerous punctures or rugae; posterior margin of each segment more or less finely and acutely crenulate.

GENOTYPE: Melanaethus elongatus Uhler (1876:280), monobasic. When Signoret (1883) transferred elongatus Uhler and Cydnus elongatus Herrick-Schaeffer to Geotomus Uhler's name became a homonym for which Signoret proposed the new name parvulus. Lobonotus Uhler was described for the lone species anthracinus Uhler (1877:395); because Uhler's use of this name was preoccupied by Milne-Edwards (1863:282) in Crustacea, Bergroth (loc. cit.) proposed Lobolophus to replace it. Lobolophus must take anthracinus Uhler for type by objective synonymy.

DISTRIBUTION: Melanaethus is restricted to the Western Hemisphere where its members occur in the area from Maryland to California in the north and south to southern Brazil.

DISCUSSION: Most members of this genus have long gone under the name Geotomus, but the few recently described species have been assigned to Geocnethus of Horvath. Most authors have considered Melanaethus to be a synonym of Mulsant and Rey's Geotomus, for which Cydnus punctulatus Costa (1847:30) was designated as type by Distant (1902:98). From the present study and a partially completed attempt to redefine the cydnid genera of the world, this position appears untenable. The New World species assigned here are not congeneric with punctulatus and can readily be separated from it by several features, as follows: 1) terminal process of osteolar peritreme punctulatus is auriculate in shape with the osteole opening near the

center of its base (Fig. 98), while this structure on American forms is variously convex posteriorly with osteole opening posteriorly on the peritreme at the base of the expansion (Figs. 96 and 97); 2) punctulatus has nine or ten submarginal setigerous punctures laterally on the pronotum, three or more of them posterior to the transverse impression, while no species of Melanaethus possesses more than six such punctures, only one of which is posterior to the transverse impression; 3) the head of punctulatus has a submarginal row of five to seven setigerous punctures bearing long, coarse hairs, while in the forms here assigned to Melanaethus all but the new species planifrons has but one such puncture. Of these characters, the shape of the terminal process of the osteolar peritreme appears to be most important.

Horvath's genus Geocnethus, to which several American species have been accredited, also has an Old World genotype, obesus Horvath (1919:248) by original designation. Examination of the type of Geocnethus obesus shows that it lacks a terminal modification of the peritreme and so surely cannot include among its closest relatives species which have a terminal modification.

The fifteen species here treated as members of Melanaethus can be arranged into rather distinct groups based on the extent of the osteolar peritreme, as indicated by the first couplet of the key to species. One group, centering around the cavicollis of Blatchley, agrees with the subgenus Rhytidoporus Rhytidoporus in appearing to be restricted to the region of the Caribbean islands with an invasion of the surrounding mainland at two points. The remainder of the species of Melanaethus are continental forms, with only two species occurring south of middle Central America.

Key to the Known Species of *Melanaethus*

1. Terminal lobe of peritreme triangular posteriorly, separated from lateral margin of evaporatorium by much more than transverse diameter of the lobe (Fig. 97). 2

   Terminal lobe of peritreme semicircular or subquadrate posteriorly, separated from lateral margin of evaporatorium by less than transverse diameter of the lobe (Fig. 96) 5

2. Anterior convexity of propleuron with numerous coarse punctures. . . . . .*cavicollis* (Blatch.) p. 143

   Anterior convexity of propleuron impunctate. 3

3. Dorsum of head and sides of anterior pronotal lobe impunctate. . . . . *cubensis* (Barb. & Brun.) p. 148

   Dorsum of head and sides of anterior pronotal lobe with several to many coarse punctures. 4

4. Posterior pronotal lobe and scutellar disc with many crowded, coarse, foveate punctures . . . . . *aereus* n.sp. p. 138

   Posterior pronotal lobe and scutellar disc with small, widely separated punctures . . . . . *externus* n.sp. p. 150

5. Dorsum of head with a fine marginal carina extending from eye to apex. 7

   Dorsum of head without a fine marginal carina or with a partial one immediately anterior to eye. 6

6. Pronotum with transverse impression and inter-callar area distinctly but obtusely impressed; labium surpassing base of sternite III. . . . . *anthracinus* (Uhl.) p. 140

Pronotum convex, transverse impression and inter-callar area not depressed; labium not surpassing middle coxae. .*spinolai* (Sign.) p. 174

7. Costal edge thick, calloused, strongly but narrowly convex dorsally; jugum with three coarse, widely separated setigerous punctures submarginally. . . . . .*planifrons* n.sp. p. 167

Costa flat, thin, neither calloused nor convex dorsally; jugum with not more than one setigerous puncture submarginally. 8

8. Head dorsally impunctate or with few patches of minute punctures. . . . . *pensylvanicus* (Sign.) p. 163

Head dorsally distinctly punctate or rugo-punctate over most of surface. 9

9. Pronotal disc, especially transverse impression, with numerous punctures of which many are as coarse as those on sides; scutellum usually distinctly punctured to base 11

Pronotal disc, especially transverse impression and posterior lobe, polished, with few minute punctures much finer than those on sides; scutellar punctation becoming obsolete basally. 10

10. Costa straight and subparallel on basal half, neither explanate nor recurved near base. . . . . *uhleri* Sign. p. 180

Costa gently convex, diverging on basal half, explanate and gently recurved near base . . . . . *subpunctatus* (Blatch.) p. 177

11. Pronotum with punctures of transverse impression and posterior lobe (and usually also of scutellum) of two sizes, coarse and fine ones intermixed. 12

Pronotum with punctures of transverse impression and posterior lobe of one size of those of latter becoming finer posteriorly, often

with fine longitudinal rugae between the punctures. 14

12. Pronotum with broad, shallow, punctate impression extending anteriorly between calli from middle of weak transverse impression. . . . . noctivagus (VanD.) p.152

Pronotum not impressed between calli. 13

13. Apical two-thirds of mesocorial disc with numerous coarse punctures subequal to those of two rows paralleling claval suture; larger, length of body, 3.6-4.2. . . . . .robustus Uhl. p.170

Apical two-thirds of mesocorial disc with scattered punctures finer than those of two rows paralleling claval suture; smaller, length of body, 3.0-3.3. . . . . mixtus n.sp. p.155

14. Pronotum with transverse impression distinctly impressed across full width; corium polished . . . . . parvulus (Sign.) p.158

Pronotum with transverse impression obsolete, absent medially; corium distinctly alutaceous. . . . . crenatus (Sign.) p.146

Melanaethus aereus NEW SPECIES

DIAGNOSIS: The small, terminal lobe of the peritreme coupled with the very coarse, sunken, close-set punctures on the posterior lobe of the pronotum and scutellum will permit recognition of aereus within the genus.

DESCRIPTION: (described from a single female) oval, widest behind midlength. HEAD: length more than two-thirds width, 0.91: 1.33; inter-ocular width, 0.73; anterior outline a very shallow semicircle, clypeus as long as juga, narrowed apically; surface shining, with radiating rows of few, coarse punctures; margin thick, submarginal dorsal carina distinct only on anterior third or half of jugum; ocelli moderately large, separated

from eye by space greater than transverse ocellar width; jugum ventrally and maxillary plate (except posteriorly) impunctate; antennals, I, 0.29: II, 0.44: III, 0.39: IV, 0.46: V, 0.60; bucculae about as high as labial II, posterior end curved; labium reaching between middle coxae, segments, I, 0.49: II, 0.81: III, 0.94: IV, 0.43. PRONOTUM: length about half width, 1.56: 3.10; anterior margin deeply, simply emarginate; lateral margin broadly, shallowly sinuate medially, submarginal row of five setigerous punctures; transverse impression absent, marking row of punctures very coarse, sunken, confused with numerous close-set punctures of posterior lobe; anterior lobe with numerous coarse, close-set punctures laterally, middle half strongly depressed for full length. SCUTELLUM: length greater than width, 2.29: 1.77; disc shining, with numerous coarse, close, sunken punctures becoming finer at apex. HEMELYTRON: clavus and corium strongly alutaceous; clavus with one long and one short row of punctures; mesocorium with numerous coarse punctures on basal third, these continued as two complete rows paralleling claval suture and with a few finer ones scattered over mesal half; exocorium with numerous finer punctures scattered irregularly for full length; costa convex, with one setigerous puncture; membranal suture feebly sinuate, lateral angle slightly produced; membrane longer than basal width, reaching apex of abdomen. PROPLEURON: shining, punctate only in depression and near acetabulum; prosternal carinae about half as high as labial II, abruptly terminated ventrally. MESOPLEURON: lateral area impunctate. METAPLEURON: peritreme terminated by small, triangular lobe which is separated from gently concave lateral margin of evaporatorium by space greater than width of terminal lobe (similar to Fig. 97); lateral area impunctate. LEGS: anterior tibia with five stout spines dorsally. STERNITES: shining, with

few coarse punctures on lateral third near posterior margin of each segment. TERMINALIA: apical margin entire, straight; gonostylus as illustrated (Fig. 206).

TYPE DATA: HOLOTYPE male, "Whitfield Hall, Blue Mts., Hayti, near 4500 ft., Aug. 13-20, 1934, Darlington," in collection of Museum of Comparative Zoology, Harvard University.

DISTRIBUTION: At present, this species is known only from the type male from Hayti.

DISCUSSION: The trivial name is in allusion to the bronzed cast that is visible on this specimen.

Melanaethus anthracinus (Uhler)

1877 Lobonotus anthracinus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:395.

1880 Lobonotus anthracinus Distant, Biol. Centr.-Am., Rhynch., 1:9, tab. 4, fig. 7.

1883 Lobonotus anthracinus Signoret, Ann. Soc. Ent. France, (6) 3:529, pl. 16, fig. 208.

1886 Lobonotus anthracinus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Lobonotus anthracinus Lethierry and Severin, Gen. Catal. Hemip., 1:77.

1910 Lobonotus anthracinus Banks, Catal. Nearct. Hemip., p. 100.

1917 Lobolophus anthracinus VanDuzee, Univ. California Pubs. Ent., 2:24.

1939 Lobolophus anthracinus Torre Bueno, Ent. Amer., 19:184.

DIAGNOSIS: The greatly elongate labium which reaches to the fourth sternite is unique within the genus.

DESCRIPTION: (based on one male and one female) MALE:- elongate, sides parallel. HEAD: length about four-fifths width, 0.82: 0.96; interocular

width, 0.66; anterior outline elongate, acute, clypeus slightly longer than juga, slightly narrowed apically; surface strongly convex transversely; juga, interocellar area and clypeus with numerous fine, close-set punctures, without or with obsolete, submarginal dorsal carinae; ocelli moderate, separated from eye by space less than twice transverse ocellar width; jugum ventrally shining, impunctate; maxillary plate with few large punctures; antennals, I, 0.23: II, 0.30: III, 0.32: IV, 0.45: V, missing; bucculae higher than labial II, roundingly terminated posteriorly; labium attaining sternite IV, segments, I, 0.23: II, 0.91: III, 0.86: IV, 0.66. PRONOTUM: length half width, 1.04: 2.08; anterior margin deeply, almost quadrately emarginate; lateral margin subparallel on basal third, with one submarginal setigerous puncture at apical angle; transverse impression post median, moderately impressed across full length, medially extended anteriorly as distinct impression between convex calli; anterior lobe with dense, moderate punctures laterally, anteriorly and medially, calli polished, with minute punctures centrally; posterior lobe densely punctate almost to hind margin. SCUTELLUM: length greater than width, 1.57: 1.30; surface shining, all except basal angles with crowded small to moderate punctures, apical half with faint suggestion of median carina. HEMELYTRON: clavus and corium polished; clavus with two rows of punctures; mesocorium with two complete rows of punctures paralleling claval suture, elsewhere with abundant, distinct punctures; exocorium with more abundant punctation; costa very narrowly convex, without setigerous punctures; membranal suture almost straight, lateral angle not prolonged; membrane slightly longer than basal width, just surpassing apex of abdomen. PROPLEURON: alutaceous, strongly punctate in depression and anteriorly to acetabulum, with few fine punctures

on anterior convexity. MESOPLEURON: evaporatorium extended into postero-lateral angle, not reaching lateral margin of segment; lateral area in part rugo-punctate. METAPLEURON: peritreme reaching almost to straight lateral margin of pronotum, terminal modification large, semicircular, distinctly alutaceous, more shining than evaporatorium; lateral area shining, with few striae. LEGS: anterior tibia with five stout spines dorsally. STERNITES: polished, finely punctate medially, very coarsely so laterally. TERMINALIA: genital capsule punctate, more densely so laterally, apical margin virtually straight; gonostylus as illustrated (Fig. 207).

FEMALE:- very similar to male. HEAD: length: width:: 0.86: 1.07; interocular width, 0.73; antennals, I, 0.23: II, 0.33: III, 0.34: IV, 0.48: V, 0.36; labials, I, 0.46: II, 1.06: III and IV missing. PRONOTUM: length: width:: 1.10: 2.28. SCUTELLUM: length: width:: 1.76: 1.34. LENGTH of body, 4.97.

TYPE DATA: The two females from which this species was originally described were "Collected in McLennan County, Texas," and are now in the Uhler collection in the United States National Museum.

DISTRIBUTION: The two specimens available for this study were labelled as coming from New Mexico and Texas.

DISCUSSION: The greatly elongate labium reaching onto basal sternites occurs in two other areas in the family as it occurs in the Western Hemisphere. In the Cydninae it appears with Dallasiellus longulus (Dallas), while in the Amnestinae it may be found on several species of Amnestus.

SPECIMENS STUDIED: 1 male, 1 female. UNITED STATES: New Mexico: "N.Mex.," P. R. Uhler collection, 1f (USNM). Texas: Colorado City, 7-17-1927, L. A. Stephenson, 1m (KU).

Melanaethus cavicollis (Blatchley)

1924 Geotomus cavicollis Blatchley, Ent. News, 35:85.

1925 Geocnethus cavicollis Hussey, Jour. New York Ent. Soc., 33:63.

1939 Geocnethus cavicollis Torre Bueno, Ent. Amer., 19:182.

DIAGNOSIS: Within the genus, cavicollis may be recognized by the reduced size of the apical modification of the peritreme and the number of coarse punctures present on most of anterior convexity of propleuron.

DESCRIPTION: MALE: elongate-oval, widest posterior to midlength. HEAD: length more than half width, 0.77 (0.72-0.83): 1.28 (1.23-1.37); interocular width, 0.80 (0.74-0.84); anterior outline a flattened semi-circle, clypeus as long as juga, narrowed apically; surface weakly convex, numerous distinct punctures arranged in radiating rows, submarginal dorsal carina distinct only on apical half or less; ocelli moderate, separated from eyes by space more than twice transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate coarsely punctate except at base of antenna; antennals, I, 0.27 (0.26-0.30): II, 0.36 (0.32-0.40): III, 0.38 (0.36-0.42): IV, 0.43 (0.40-0.47): V, 0.58 (0.56-0.60); bucculae higher than labial II, abruptly sloping posteriorly; labium extending between middle coxae, segments, I, 0.44 (0.43-0.46): II, 0.75 (0.73-0.82): III, 0.55 (0.53-0.60): IV, 0.40 (0.40-0.42). PRONOTUM: length more than half width, 1.45 (1.36-1.55): 2.75 (2.52-3.04); anterior margin moderately, simply concave; lateral margin straight to very weakly concave on middle third, with submarginal row of four or five setigerous punctures; transverse impression almost absent, site marked by irregular row of coarse, widely separated punctures; anterior lobe with coarse punctures clustered

behind each eye and in broad lateral band, middle half strongly impressed for full length; posterior lobe coarsely, closely punctate laterally and sparsely so medially. SCUTELLUM: length greater than width, 1.97 (1.86-2.15): 1.68 (1.62-1.81); disc shining, with scattered, coarse punctures on apical three-fourths. HEMELYTRON: clavus and corium weakly alutaceous; claval punctures arranged in one complete row and sometimes partial second row basally; mesocorium distinctly punctate except at middle, mesal punctures arranged in two complete rows; exocorium distinctly punctate for full length; costa convex, with two setigerous punctures; membranal suture straight, lateral angle not prolonged; membrane longer than basal width, reaching apex of abdomen. PROPLEURON: strongly punctate on anterior convexity and in depression; prosternal carinae less than half as high as labial II, abruptly terminated posteriorly. MESOPLEURON: lateral area with not more than one or two distinct punctures. METAPLEURON: (Fig. 97) terminal process of peritreme triangular posteriorly, separated from straight edge of evaporatorium by space much greater than transverse width of terminal modification. LEGS: anterior tibia with five stout spines dorsally. STERNITES: shining, obsoletely alutaceous, with numerous distinct punctures on lateral fourth of each, elsewhere minutely punctate. TERMINALIA: genital capsule shining, impunctate, apical margin slightly convex either side of middle; gonostylus as figured (Fig. 208). LENGTH of body, 5.42 (5.05-5.97).

FEMALE:- similar to male but lacking prominent impression in middle of anterior pronotal lobe. HEAD: length: width:: 0.87 (0.85-0.91): 1.27 (0.20-1.36); interocular width, 0.73 (0.70-0.76); antennals, I, 0.27 (0.26-0.30): II, 0.35 (0.32-0.42): III, 0.36 (0.33-0.40): IV, 0.42 (0.40-0.45): V, 0.56 (0.52-0.60); labials, I, 0.42 (0.41-0.46): II, 0.75 (0.73-0.82): III, 0.53

(0.48-0.56): IV, 0.41 (0.40-0.43). PRONOTUM: length: width:: 1.44 (1.31-1.62): 2.68 (2.45-2.95). SCUTELLUM: length: width:: 1.93 (1.75-2.12): 1.62 (1.49-1.75). LENGTH of body, 5.34 (4.95-5.83).

TYPE DATA: The types, taken from "Arch Creek and Dunedin, Florida," are in the Blatchley collection at Purdue University, Lafayette, Indiana.

DISTRIBUTION: All specimens examined had come from Florida and South Carolina in the southeastern United States.

DISCUSSION: Both Blatchley and Hussey, in the citations listed above, reported taking this species from the ground under leaves or other debris. Specimens examined bore the notations, "in woods trash," and "Berlese funnel material, in dry magnolia-hickory hammock."

The four species that run through the first half of the first couplet of the key to species form a close-knit unit that probably deserves taxonomic recognition of some sort, perhaps as a subgenus. This group would be characterized by the small, triangular terminal process of the osteolar peritreme which is separated from the lateral edge of the evaporatorium by a space greater than the transverse width of the process, by the thick, calloused margins of the head with the incomplete, submarginal, dorsal carina. Since three of the four specimens which would be included in such a group are represented by only one specimen in the material studied, the author hesitates to make such a division at this time.

SPECIMENS STUDIED: 7 males, 8 females. UNITED STATES: Florida: Alachua Co., Gainesville, X-13, 1923, T. H. Hubbel, 1m, 2f (RHF). Edgewater, III-6 '39, C. A. Frost, 2m, 1f (USNM). Gainesville, W. E. Penner collector, 1m (USNM). Same locality, Feb. 1930, W. S. Blatchley (BrM). Miaku, 2-3, 1911, W. S. B. Coll., 1f (CalAc). Newman's Lake, 15-III-1926,

T. H. Hubbell, Berlese funnel material in dry magnolia-hickory hammock, 1m, det. Geocnethus cavicollis by R. I. Sailer (KU). South Carolina: Florence, 2-1-39, C. F. Rainwater, in woods trash, 3m, 2f (USNM, RCF).

Melanaethus crenatus (Signoret) NEW COMBINATION

1883 Geotomus (Melanaethus) crenatus Signoret, Ann. Soc. Ent. France, (6) 3:208, pl. 4, fig. 11.

1886 Melanethus crenatus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Geotomus crenatus Lethierry and Severin, Gen. Catal. Hemip., 1:72.

DIAGNOSIS: Among those species of the genus with the large terminal lobe on the peritreme this one may be recognized by the distinctly alutaceous coria.

DESCRIPTION: MALE:- elongate-oval, sides subparallel. HEAD: length about two-thirds width, 0.56 (0.54-0.60): 0.81 (0.80-0.82); interocular width, 0.56 (0.55-0.60); anterior outline a more or less truncated semicircle, clypeus as long as juga, narrowed apically; dorsum densely and in part confluently punctate; with distinct marginal carina dorsally; ocelli very small, separated from eye by space more than three times transverse ocellar width; jugum ventrally shining; maxillary plate punctate; antennals, I, 0.16 (0.15-0.19): II, 0.16 (0.16-0.18): III, 0.19 (0.17-0.20): IV, 0.25 (0.23-0.26): V, 0.33 (0.33-0.35); bucculae higher than labial II, abruptly terminated posteriorly; labium attaining bases of middle coxae; segments, I, 0.22 (0.20-0.23): II, 0.44 (0.37-0.50): III, 0.30 (0.27-0.33): IV, 0.25 (0.22-0.26). PRONOTUM: length more than half width, 0.91 (0.86-0.93): 1.67 (0.64-0.70); anterior margin moderately, singly emarginate; lateral margin nearly straight and subparallel on basal half, without setigerous punctures

submarginally; transverse impression weak to obsolete, postmedian, without a special line of coarser punctures marking it; anterior lobe with numerous prominent punctures laterally, subapically and medially, calli polished, with several scattered, finer punctures; posterior lobe with numerous prominent, elongate punctures over entire surface, sometimes with short, longitudinal rugulae between. SCUTELLUM: longer than wide, 1.19 (1.13-1.23): 0.96 (0.93-1.01); surface sculpture similar to but less dense than that of posterior pronotal lobe. HEMELYTRON: clavus and corium alutaceous; clavus with one or two partial rows in addition to one complete row; mesocorium with two complete rows of punctures paralleling claval suture, elsewhere with well-separated punctures becoming much finer apically; punctation of exocorium similar to but more dense than that of mesocorium; costa without setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, usually just reaching apex of abdomen. PROPLEURON: shining, with numerous irregular, anastomosing, longitudinal rugae; prosternal carinae almost as high as labial II, abruptly terminated posteriorly. MESOPLEURON: evaporatorium extended into posterolateral angle, not reaching lateral margin of segment; lateral area in part rugo-punctate. METAPLEURON: terminal lobe of peritreme semicircular, reaching almost to convex lateral margin of evaporatorium; lateral area in part rugo-punctate. LEGS: anterior tibia with five or six stout spines dorsally. STERNITES: shining and minutely punctate on middle half, coarsely rugo-punctate on lateral fourth. TERMINALIA: genital capsule shining, distinctly punctate in lateral angles, apical margin straight; gonostylus as illustrated (Fig. 209). LENGTH of body, 3.32 (3.18-3.42).

FEMALE:- similar to males, measurements averaging larger. HEAD: length: width:: 0.60 (0.56-0.64): 0.83 (0.80-0.91); interocular width, 0.59 (0.56-0.63); antennals, I, 0.17 (0.16-0.20): II, 0.18 (0.15-0.20): III, 0.19 (0.14-0.24): IV, 0.25 (0.25-0.26): V, 0.34 (0.33-0.37); labials, I, 0.22 (0.19-0.26): II, 0.42 (0.36-0.51): III, 0.31 (0.26-0.36): IV, 0.26 (0.24-0.33). PRONOTUM: length: width:: 0.94 (0.90-1.03): 1.73 (1.62-1.87). SCUTELLUM: length: width:: 1.26 (1.13-1.34): 1.04 (0.90-1.16). LENGTH of body, 3.43 (3.25-3.60).

TYPE DATA: Signoret (loc. cit.) described this species from "Mexique." The type is probably in the Naturhistorisches Museum in Vienna.

DISTRIBUTION: The more than fifty specimens available for study had all come from Arizona and Texas in the southwestern United States and from Mexico and Lower California to the south.

DISCUSSION: The Laredo, Texas, specimen listed below was taken from an orchid which had been imported from Guerrero, Mexico. One other specimen was labelled, "Taken at light."

SPECIMENS STUDIED: 32 males, 31 females. UNITED STATES: Arizona: Gila Co., Miller Canyon (Huachuca Mts.), Nogales, Sabino Canyon (Santa Catalina Mts.); April, August, November. Texas: Laredo (on orchid from Mexico), San Antonio, Sheffield; March, April, June. MEXICO: Mexico: Tejupilco.

Melanaethus cubensis (Barber and Bruner) NEW COMBINATION

1932 Geocnethus cubensis Barber and Bruner, Jour. Dept. Agr. Peurto Rico, 16:236.

DIAGNOSIS: The combination of the small terminal lobe of the peritreme and the lack of punctures on the head and anterior pronotal lobe

will permit ready recognition of this species among the other members of the genus.

DESCRIPTION: (based on the paratype female from the collection of the United States National Museum) elongate-oval, sides nearly parallel. HEAD: length about two-thirds width, 0.83: 1.21; interocular width, 0.70; anterior outline almost semicircular, clypeus as long as juga, narrowing towards apex; margin of head thick, calloused, dorsal "carina" distinctly submarginal; surface somewhat flattened, little depressed submarginally, mostly obsoletely alutaceous, virtually impunctate; ocelli large, separated from eye by space greater than transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate punctate ventrally and posteriorly; antennals, I, 0.26: II, 0.38: III, 0.38: IV, 0.43: V, 0.62; bucculae not as high as labial II; labium reaching between middle coxae, segments, I, 0.40: II, 0.80: III, 0.56: IV, 0.43. PRONOTUM: length more than half width, 1.43: 2.69; anterior margin shallowly emarginate; lateral margin weakly sinuate at anterior third, with submarginal row of four or five setigerous punctures; transverse impression virtually absent, indicated laterally by few small punctures; both lobes obsoletely alutaceous, minutely punctate; anterior lobe without large punctures, with obsolete, subapical impression; posterior lobe with not more than five small punctures. SCUTELLUM: longer than wide, 2.02: 1.62; surface obsoletely alutaceous, minutely punctured, with few coarse punctures scattered over disc. HEMELYTRON: clavus and corium distinctly alutaceous; clavus with one row of punctures; corium with one complete row of punctures and basal part of second row paralleling claval suture; costa convex, with two setigerous punctures; membranal suture weakly sinuate, lateral angle not prolonged; membrane longer than basal width, surpassing

apex of abdomen. PROPLEURON: both convexities impunctate; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate. METAPLEURON: terminal lobe of peritreme triangular posteriorly, removed from straight lateral margin of evaporatorium by space greater than width of terminal lobe (somewhat similar to Fig. 97); lateral area impunctate. LEGS: anterior tibia with five dorsal spines; posterior tibia weakly sinuate subapically. STERNITES: alutaceous, with several coarse, shallow punctures in spiracular area. LENGTH of body, 5.36.

TYPE DATA: The type male was from "Cayamas," Cuba. Both the type and the paratype female, which was also from Cuba, are in the collection of the United States National Museum.

DISTRIBUTION: The author does not know this species from specimens other than the two types listed above, so the only distribution he can report is that on the island of Cuba.

DISCUSSION: Although abundant material of other species is at hand for the islands of the West Indies, this species was not represented, suggesting that perhaps it is not a common species.

SPECIMEN STUDIED: Sierra Rangel, Cuba, Aug. 28/29, J. Acuna y S. C. Bruner, Col., 1f (Paratype in collection USNM).

Melanaethus externus NEW SPECIES

DIAGNOSIS: Within the genus *Melanaethus* this species may be recognized by the reduced, triangular terminal process of the peritreme, the presence of numerous, coarse punctures on head and side of anterior pronotal lobe, and the lack of punctures on the anterior convexity of the propleuron.

DESCRIPTION: (Based on one female) FEMALE:- elongate-oval, widest posterior to midlength. HEAD: length about two-thirds width, 0.80: 1.12; interocular width, 0.66; anterior outline a full semicircle, clypeus as long as juga, narrowed apically; surface slightly convex, juga with numerous crowded punctures, margin thick, with partial, submarginal dorsal carina; ocelli small, separated from eye by space more than three times transverse ocellar width; jugum ventrally and maxillary plate (except posteriorly) shining, impunctate; antennals, I, 0.26: II, 0.33: III, 0.34: IV, 0.41: V, missing; bucculae about as high as labial II, abruptly terminated posteriorly; labium reaching bases of middle coxae, segments, I, 0.40: II, 0.77: III, 0.49: IV, 0.40. PRONOTUM: length about half width, 1.26: 2.40; anterior margin deeply, doubly emarginate; lateral margin straight to faintly concave on middle third, with submarginal row of five setigerous punctures; transverse impression weak, post median, marked by irregular double row of distinct punctures; anterior lobe with single row of distinct punctures paralleling anterior emargination between eyes, and with broad patch of them laterally; posterior lobe with few punctures scattered medially and laterally. SCUTELLUM: longer than wide, 1.82: 1.43; surface shining, with irregularly scattered, strong punctures over surface except at base and apex. HEMELYTRON: clavus and corium alutaceous; clavus punctate near base and with single longitudinal row; mesocorium with one complete row of punctures paralleling claval suture and with punctures crowded on basal third; exocorium with few punctures scattered along length; costa convex, with one setigerous puncture; membranal suture nearly straight; membrane longer than basal width, reaching apex of abdomen. PROPLEURON: shining, distinctly punctate only in depression and at base of acetabulum; prosternal carinae

about half as high as labial II, abruptly terminated posteriorly. MESOPLEURON: lateral area rugose, impunctate. METAPLEURON: terminal lobe of peritreme triangular posteriorly, separated from straight lateral margin of evaporatorium by space greater than transverse width of lobe; lateral area impunctate. LEGS: anterior tibia with six stout spines dorsally. STERNITES: finely alutaceous, with very few punctures behind spiracular area. LENGTH of body, 4.71.

TYPE DATA: The HOLOTYPE female in the collection of the United States National Museum is labelled, "Vera Cruz, Mexico, F. H. B., 586."

DISTRIBUTION: The lone specimen (the female type) examined during this study was from the center of the eastern coast of Mexico.

DISCUSSION: For comments concerning relationships of this form, see discussion under M. cavicollis Blatchley.

Melanaethus noctivagus (VanDuzee)

1923 Geotomus noctivagus VanDuzee, Proc. California Acad. Sci., (4) 12:125.

1939 Geotomus noctivagus Torre Bueno, Ent. Amer., 19:181.

DIAGNOSIS: The short labium (reaching only to middle coxae) and the punctate depressed area between the calli (Fig. 67) will permit recognition of this form among all those with a large terminal lobe on the peritreme.

DESCRIPTION: MALE:- elongate-oval, widest at or immediately anterior to humeri. HEAD: length almost three-fourths width, 0.59 (0.56-0.61): 0.79 (0.76-0.82); interocular width, 0.51 (0.50-0.53); anterior outline a prolonged semicircle, clypeus as long as juga, weakly narrowed apically;

surface with numerous moderate, well-separated punctures; with distinct, marginal carina dorsally; with no submarginal punctures; ocelli large, separated from eye by space less than twice transverse ocellar width; jugum ventrally and maxillary plate, impunctate; antennals, I, 0.16 (0.14-0.18); II, 0.21 (0.20-0.23); III, 0.21 (0.20-0.23); IV, 0.29 (0.27-0.31); V, 0.37 (0.36-0.41); bucculae higher than labial II, abruptly terminated posteriorly; labium extended to middle coxae, segments, I, 0.21 (0.20-0.24); II, 0.39 (0.36-0.43); III, 0.26 (0.25-0.28); IV, 0.24 (0.22-0.26). PRONOTUM: length about half width, 0.88 (0.86-0.92); 1.65 (1.57-1.67); anterior margin deeply, simply emarginate; lateral margins straight and subparallel on basal third, posterior angle hidden by swollen lateral portion of posterior lobe, submarginally with six setigerous punctures bearing short, fine setae; transverse impression weak but distinct across full width, medially expanded posteriorly and anteriorly between calli as punctate basin (Fig. 67); anterior lobe with strong punctures laterally and subapically, with scattered minute punctures on calli; posterior lobe distinctly punctate across full width, usually with much finer punctures between. SCUTELLUM: longer than wide, 1.25 (1.20-1.33); 1.00 (0.93-1.03); surface shining and, except basal angles, with numerous large and small punctures. HEMELYTRON: clavus and corium polished; clavus with row of punctures double at base; mesocorium with two complete rows of punctures paralleling claval suture, elsewhere with numerous distinct punctures; exocorium more densely punctate than mesocorium; costa flattened and punctate, without setigerous punctures; membranal suture weakly sinuate, lateral angle feebly produced; membrane variable, longer than basal width in macropterous forms and shorter than basal width in brachypterous forms.

PROPLEURON: anterior convexity alutaceous, with crowded small punctures on anterior half; depression with several coarse punctures. MESOPLEURON: evaporatorium usually extended into postero-lateral angle but not reaching lateral margin of segment; lateral area with numerous coarse punctures. METAPLEURON: terminal lobe of peritreme large, reaching almost to convex lateral margin of somewhat limited evaporatorium; lateral area with numerous coarse punctures. LEGS: anterior tibia with five or six stout spines on dorsal margin. STERNITES: medially alutaceous and minutely punctate, laterally with numerous close, coarse punctures and longitudinal rugae. TERMINALIA: genital capsule shining or weakly alutaceous, punctate, more densely so laterally, apical margin straight; gonostylus as illustrated (Fig. 210). LENGTH of body, 3.60 (3.46-3.74).

FEMALE:- similar to male. HEAD: length: width:: 0.59 (0.54-0.70): 0.81 (0.73-0.91); interocular width, 0.52 (0.46-0.63); antennals, I, 0.15 (0.14-0.17): II, 0.21 (0.20-0.23): III, 0.21 (0.20-0.26): IV, 0.29 (0.26-0.33): V, 0.37 (0.33-0.40); labials, I, 0.19 (0.17-0.21): II, 0.38 (0.36-0.41): III, 0.29 (0.24-0.33): IV, 0.26 (0.24-0.30). PRONOTUM: length: width:: 0.87 (0.83-0.97): 1.64 (1.53-1.89). SCUTELLUM: length: width:: 1.27 (1.18-1.46): 0.97 (0.91-1.10). LENGTH of body, 3.49 (3.17-4.01).

TYPE DATA: The type male and paratype female, both now in the collection of the California Academy of Sciences, were taken "at San Carlos Bay, Sonora," Mexico.

DISTRIBUTION: The specimens studied had come from the western states of North America from Washington south through California and Arizona into Sonora in northern Mexico.

DISCUSSION: The placement of this species close to pensylvanicus on the basis of the punctation of the head was not justified by the material at hand. All material seen, including the female paratype from San Carlos Bay, Sonora, showed distinct and often crowded punctures on the head, not the minute punctation of pensylvanicus. This is in contradiction to VanDuzee's original description which says, "superior surface minutely, obscurely, punctured." Comparison of specimens with the type will settle the question.

SPECIMENS STUDIED: 10 males, 28 females. UNITED STATES: Arizona: Atascosa Mt., Cochise Co., Higley, Mesa, Oracle, Phoenix, Pima Co., Thatcher, Tucson, Yuma Co.; January, June, July, August. California: Coachella, Davis, San Carlos Bay, San Diego; January, May, July. Idaho: Rupert; August. Washington: Wilbur; March. MEXICO: Sonora: Hermosillo; May.

Melanaethus mixtus NEW SPECIES

DIAGNOSIS: The small size, presence of two types of punctures on posterior lobe of the pronotum, lack of an impression between the calli and the large terminal lobe on the peritreme will permit separation of this species from others in the genus.

DESCRIPTION: MALE:- (two specimens, one lacking antennae and labium) oval, robust, sides subparallel or weakly diverging posteriorly. HEAD: length almost two-thirds width, 0.47 (0.47-0.47): 0.76 (0.76-0.76); interocular width, 0.52 (0.51-0.53); anterior outline broad, less than a semicircle, clypeus as long as or very slightly longer than juga; surface, including clypeus, shining, with crowded, distinct punctures; jugum with

distinct, marginal carina dorsally, one submarginal setigerous puncture; ocelli small, separated from eye by space more than twice transverse ocellar width; jugum ventrally shining, impunctate; maxillary plate distinctly punctate on basal two-thirds; antennals (missing from larger specimen), I, 0.16; II, 0.16; III, 0.16; IV, 0.23; V, 0.27; bucculae higher than labial II, abruptly terminated posteriorly; labium reaching between middle coxae, segments (missing from larger specimen), I, 0.21; II, 0.40; III, 0.27; IV, 0.23. PRONOTUM: length slightly more than half width, 0.87 (0.84-0.90); 1.60 (1.56-1.64); anterior margin moderately, simply emarginate; lateral margin straight on basal half, without submarginal row of setigerous punctures; transverse impression obsolete, postmedian, without defining row of special punctures; anterior lobe with numerous crowded punctures laterally, subapically and between calli, latter with minute punctures discally; posterior lobe with fine punctures over entire width, these mixed with coarser ones anteriorly. SCUTELLUM: longer than wide, 1.16 (1.15-1.17); 0.94 (0.93-0.95); shining; surface, except basal angles, with scattered fine and coarse punctures. HEMELYTRON: clavus and corium polished or weakly alutaceous; clavus with one-and-one-half rows of punctures; mesocorium with two rows of punctures paralleling claval suture, elsewhere punctures becoming much finer and more widely scattered towards apex; exocorium punctate similar to mesocorium; costa flattened, slightly reflexed, without setigerous punctures; membranal suture straight, lateral angle not prolonged; membrane longer than basal width, reaching apex of abdomen. PROPLEURON: anterior convexity with numerous crowded, longitudinal rugulae, depression with coarser punctures; prosternal carinae less than

half as high as labial II, abruptly terminated posteriorly. MESOPLEURON: evaporatorium reaching into postero-lateral angle but not to side margin of segment; lateral area in part coarsely rugo-punctate. METAPLEURON: peritreme terminated by large, semicircular lobe reaching almost to lateral margin of evaporatorium; lateral area with few distinct striae. LEGS: anterior tibia with five stout spines dorsally. STERNITES: weakly alutaceous and minutely punctate, with few distinct punctures and weak rugae laterally near spiracular area. TERMINALIA: genital capsule with few more punctures laterally, apical margin entire, weakly convex; gonostylus as illustrated (Fig. 211). LENGTH of body, 3.08 (3.03-3.13).

FEMALE:- similar to male. HEAD: length: width:: 0.52 (0.50-0.56): 0.79 (0.78-0.83); interocular width, 0.54 (0.53-0.56); antennals, I, 0.16 (0.16-0.19): II, 0.17 (0.16-0.20): III, 0.18 (0.16-0.23): IV, 0.24 (0.21-0.27): V, 0.30 (0.27-0.33); labials, I, 0.20 (0.20-0.22): II, 0.38 (0.33-0.41): III, 0.31 (0.30-0.33): IV, 0.24 (0.22-0.30). PRONOTUM: length: width:: 0.92 (0.88-0.95): 1.67 (1.58-1.76). SCUTELLUM: length: width:: 1.23 (1.17-1.31): 0.98 (0.93-1.06). LENGTH of body, 3.17 (3.09-3.29).

TYPE DATA: HOLOTYPE male, "Guatemala, intercepted Br.[ownsville], Tex. 66430, 6-14-48-10336, Sobralia sp.," and ALLOTYPE female, "Guatemala, X-12-43, Sobralia macrantha 43-19570, intercepted San Francisco, Cal. #18417," both in the collection of the United States National Museum. PARATYPES: (all originated elsewhere but were intercepted in the United States) Mexico on pineapple, N. Orleans, La., V-12-37. Tamazunchalo, S. L. P. Mex., Lar. edo, Tex., #45202, 10-10-47-15305, on orchid plants, 1f (USNM). Maiz S. L. P. Mex., Lar.[edo], Tex., 43818, 5-19-47-7684, Laelia anceps, 1f (RCF). Mexico D. F., Mex., 8-23-45, Lar.[edo], Tex., 37281,

Lilium longiflorum, 2f (USNM).

DISTRIBUTION: Although all specimens studied had actually been collected in the United States, they had originated in either Mexico or Guatemala and had been intercepted at quarantine stations upon their entry into this country.

DISCUSSION: Judging from the number of interceptions of specimens, it appears that this species must occur in some abundance in Mexico and Guatemala. If such is the case, it is surprising that none of the collections examined had specimens collected in their native countries. Actually, this situation just points up how poorly known is the fauna of certain countries, especially for groups that require specialized collecting techniques.

Melanaethus parvulus (Signoret) NEW COMBINATION

1876 Melanaethus elongatus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 1:280.

1877 Melanaethus elongatus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:393.

1883 Geotomus parvulus Signoret, Ann. Soc. Ent. France, (6) 3:208.

1883 Geotomus (Melanaethus) punctatissimus Signoret, Ann. Soc. Ent. France, (6) 3:216, fig. 180, pl. 5.

1886 Melanaethus elongatus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Melanaethus punctatissimus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Geotomus parvulus Lethierry and Severin, Gen. Catal. Hemip., 1:72.

1893 Geotomus punctatissimus Lethierry and Severin, Gen. Catal. Hemip. 1:73.

1910 Geotomus parvulus Banks, Catal. Nearct. Hemip., p. 100.

1910 Geotomus punctatissimus Banks, Catal. Nearct. Hemip., p. 100.

1917 Geotomus parvulus VanDuzee, Univ. California Pubs. Ent., 2:22.

1917 Geotomus punctatissimus VanDuzee, Univ. California Pubs. Ent., 2:22.

1939 Geotomus parvulus Torre Bueno, Ent. Amer., 19:181.

1939 Geotomus punctatissimus Torre Bueno, Ent. Amer., 19:182.

DIAGNOSIS: Among the species of Melanaethus with the large terminal modification of the peritreme extending almost to the lateral margin of the evaporatorium, this one may be recognized by its very elongate form and the fact that the transverse impression is distinct across its entire width but not expanded medially.

DESCRIPTION: MALE:- elongate-oval, slender for the genus, sides parallel. HEAD: length about three-fourths width, 0.63 (0.62-0.64): 0.82 (0.80-0.86); interocular width, 0.53 (0.50-0.56); anterior outline elongate, distinctly roundingly truncated, clypeus as long as juga, scarcely narrowed at apex; surface, including clypeus, with numerous crowded punctures; jugum with distinct marginal carina dorsally, with one submarginal puncture anterior to eye; jugum ventrally shining, impunctate; maxillary plate alutaceous, feebly punctate; antennals, I, 0.17 (0.16-0.20): II, 0.18 (0.16-0.20): III, 0.22 (0.22-0.23): IV, 0.27 (0.26-0.30): V, 0.37 (0.36-0.40); bucculae higher than labial II, abruptly terminated posteriorly; labium reaching between middle coxae, segments, I, 0.23 (0.21-0.24): II, 0.42 (0.40-0.45): III, 0.30 (0.28-0.32): IV, 0.22 (0.21-0.24). PRONOTUM: length more than half width, 0.85 (0.81-0.92): 1.58 (1.51-1.67); anterior margin shallowly, simply emarginate; lateral margin straight on basal half or more, submarginal row of five setigerous punctures; transverse impression postmedian, distinctly and almost equally depressed across full width, not marked by special row of punctures; anterior lobe with coarse, crowded punctures laterally and subapically, medially with fine punctures,

calli with few minute punctures; posterior lobe shining, with numerous moderate punctures scattered nearly or quite to hind margin. SCUTELLUM: length greater than width, 1.13 (1.06-1.20): 0.92 (0.86-0.97); shining, with numerous well-separated punctures over surface except in basal angles. HEMELYTRON: clavus and corium shining; clavus with one and one-half rows of punctures; mesocorium with two complete rows of punctures paralleling claval suture, elsewhere punctation sparse, fine, becoming little coarser towards base; exocorium punctate similar to mesocorium; costa thin, weakly reflexed on basal half, with one setigerous puncture dorsally near base; membranal suture straight, lateral angle not produced; membrane little longer than basal width, just attaining apex of abdomen. PROPLEURON: anterior convexity longitudinally rugo-punctate; depression with few coarse punctures; prosternal carinae about as high as labial II, anterior margin long, vertical, produced ventrally as small, semicircular lobe. MESOPLEURON: evaporatorium reaching into postero-lateral angle, not attaining lateral margin of segment; lateral area shining, in part rugo-punctate. METAPLEURON: terminal modification of peritreme large, semicircular, reaching almost to lateral margin of evaporatorium; lateral area with several coarse punctures. LEGS: anterior tibia with five or six stout spines dorsally. STERNITES: polished, minutely punctate, with several weak rugae laterally near spiracular area. TERMINALIA: genital capsule shining, punctures becoming dense laterally, apical margin weakly decurved; gonostylus as illustrated (Fig. 213). LENGTH of body, 3.33 (3.16-3.55).

FEMALE:- similar to male, most measurements averaging larger. HEAD: length: width:: 0.65 (0.63-0.67): 0.85 (0.83-0.87); interocular width, 0.53 (0.51-0.56); antennals, I, 0.18 (0.16-0.22): II, 0.20 (0.18-0.23):

III, 0.24 (0.23-0.25): IV, 0.30 (0.30-0.33): V, 0.38 (0.34-0.40); labials, I, 0.24 (0.23-0.26): II, 0.44 (0.42-0.46): III, 0.33 (0.31-0.35): IV, 0.23 (0.21-0.26). PRONOTUM: length: width:: 0.88 (0.85-0.91): 1.64 (1.63-1.67). SCUTELLUM: length: width:: 1.19 (1.15-1.23): 0.95 (0.97-1.00). LENGTH of body, 3.46 (3.43-3.50).

TYPE DATA: The original locality, as given by Uhler (loc. cit. p. 281), under the name Melanaethus elongatus, was "California." The type is now in the collection of the United States National Museum. In 1883 Signoret transferred Uhler's species and Herrick-Schaeffer's (1839:97) Cydnus elongatus into Geotomus, making Uhler's species a junior synonym of Herrick-Schaeffer's species and proposing for it the new name parvulus. The type locality given by Signoret (loc. cit.) for G. punctatissimus was "Sitka."

DISTRIBUTION: The material studied indicated that the range of this species includes the following states in the southwestern United States and northwestern Mexico, Arizona, California, Nevada, New Mexico and Utah, and Sonora and Lower California in Mexico; in addition, a specimen that is undoubtedly of the present species is labelled as having been collected on Bindloe Island in the Galapagos far off the coast of Ecuador.

DISCUSSION: The ecological notes on the specimens tell little about the habits of the species because they represent the usual collecting places for members of the family, i.e., at lights and under objects on the ground. There is one specimen, however, which does bear an interesting label which the author prefers to disbelieve. The specimen is labelled, "Sao Paulo, Brizil [!], San.F. 23832, VII-8-47-10080." The Brazilian locality would suggest that the specimen was from that country, while the

abbreviation "San F." indicates that it was intercepted in commerce at that quarantine station. Since San Francisco is within the known range of parvulus and Brazil is very far removed from it, the author prefers to interpret this as a case of contamination after the products to be examined arrived in California.

Although the type of Geotomus punctatissimus was not available for examination during this period of study, the author feels confident in placing that name as a synonym of parvulus. There is nothing in the original description to exclude such placement except that the type locality is outside of the range of parvulus as determined here. But additional material for parvulus will undoubtedly show it to range somewhat farther north, perhaps into Oregon and Washington, as studies have shown for many coastal forms in other groups. Another possible excuse for not considering this discrepancy too seriously is that the collection of the type was made at a time when that section of North America was not too populous and geographic localities may not have been taken too seriously by collectors in the region. Other type localities of certain other species as cited for Signoret (i.e. for Aethus politus) do not fall within the presently determined limits (which are admittedly very incomplete) of the species concerned. And finally, most travel in that region during the early days was by boat and it is quite possible that the specimen may have been taken from a ship which had picked it up at a port farther south. The insect may have come to the lanterns on the ship. The illustration presents several features which make this synonymy likely, 1) the shape and vestiture of the head, 2) the five setigerous punctures on the submargin of the pronotum, 3) the single, sub-basal setigerous puncture on the costa and

4) the elongate, parallel form. The only discrepancy between the figure and specimens of parvulus is the complete punctation of the calli in the illustration. However, since Signoret's description remarks on the presence of smooth areas on the anterior pronotal lobe, the drawing may be in error.

SPECIMENS STUDIED: 80 males, 110 females. UNITED STATES: Arizona: Aquila, Baboquivari Canyon (Pima Co.), Douglas, Florence, Gila Bend, Globe, Grand Canyon (Desert View), Nogales, Patagonia, Phoenix, Roosevelt Dam, Sabino Canyon (Santa Catalina Mts.), Thatcher, Tucson, Yuma, Warren; April to August. California: Borego Valley, Campo, Clayton, Coachella, Colton, Death Valley, Edison, Imperial Co., Lindsay, Los Angeles, Mt. Diablo, Needles, Niles Canyon (Alameda Co.), Oakland, Ojai, Orange, Palm Springs, Paso Robles, Ripley, Tanbark Flats (Los Angeles Co.), San Diego, San Felipe Valley (San Diego Co.), San Francisco, San Quenton, Santa Anna River, Santa Cruz, Sobabo Springs; March to November. Nevada: Boulder Dam, Carson City, Las Vegas; June to August. New Mexico: Glovis; August. Utah: Delta, Oasis; July, August. MEXICO: Sonora: San Bernardino; June. Lower California: Mesquital, San Fernando, San Ignacio; July. ECUADOR: Galapagos Islands: Brindloe Island.

Melanaethus pensylvanicus (Signoret) NEW COMBINATION

1876 Cydnus (Melanaethus) picinus Uhler, Bull. United States Geol. Geogr. Surv. Terr., vol. 2, pl. 19, fig. 17 (figured, but not mentioned in text).

1877 Melanaethus picinus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:391 (designated "new sp." here).

1883 Geotomus pensylvanicus Signoret, Ann. Soc. Ent. France, (6) 3:207, pl. 4, fig. 169.

1886 Melanaethus picinus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Geotomus pensylvanicus Lethierry and Severin, Gen. Catal. Hemip., 1:72.

1910 Geotomus pennsylvanicus Banks, Catal. Nearct. Hemip., p. 100.

1917 Geotomus pennsylvanicus VanDuzee, Univ. California Pubs. Ent., 2:22.

1939 Geotomus pennsylvanicus Torre Bueno, Ent. Amer., 19:181.

DIAGNOSIS: Among the species of Melanaethus with the large terminal lobe on the peritreme, this one may be recognized by having the head impunctate or with scattered minute punctures.

DESCRIPTION: MALE:- oval, widest behind midlength. HEAD: length almost two-thirds width, 0.54 (0.50-0.56): 0.84 (0.83-0.86); interocular width, 0.52 (0.52-0.53); anterior outline a strongly flattened semicircle, clypeus as long as juga, narrowed apically; dorsum distinctly convex, with several minute punctures scattered over surface; with distinct marginal carina dorsally; submarginally with three widely separated setigerous punctures; ocelli moderate, separated from eye by space more than twice transverse ocellar width; jugum ventrally shining, impunctate; maxillary plate with crowded punctures; antennals, I, 0.15 (0.13-0.16): II, 0.16 (0.16-0.17): III, 0.19 (0.17-0.23): IV, 0.24 (0.23-0.26): V, 0.31 (0.30-0.33); bucculae about as high as labial II, abruptly terminated posteriorly; labium attaining bases of middle coxae, segments, I, 0.24 (0.23-0.27): II, 0.39 (0.36-0.43): III, 0.28 (0.26-0.32): IV, 0.23 (0.23-0.26). PRONOTUM: length more than half width, 0.93 (0.93-0.94): 1.74 (1.72-1.79); anterior margin shallowly, simply emarginate; lateral margin straight on basal third or half, with submarginal row of five or six setigerous punctures; transverse impression postmedian, obsolete, not marked by special row of punctures; anterior lobe with lateral patch of distinct punctures, with

several minute punctures medially and scattered over calli; posterior lobe with numerous fine punctures across full width. SCUTELLUM: length greater than width, 1.25 (1.25-1.28): 1.09 (1.08-1.11); surface, except basal angles, with scattered intermixed minute and moderate punctures. HEMELYTRON: clavus and corium polished; clavus with one or two partial rows of punctures in addition to the complete one; mesocorium with two complete rows of punctures paralleling claval suture, elsewhere with scattered punctures becoming coarser and closer basally; exocorium with irregular punctation, punctures most numerous subcostally; costa straight on basal third, diverging, with one setigerous puncture located dorsally near base; membranal suture straight, lateral angle not produced; membrane longer than basal width, reaching or slightly surpassing apex of abdomen. PROPLEURON: alutaceous, with minute punctures on anterior convexity and several coarser ones in depression; prosternal carinae less than half as high as labial II, more or less abruptly terminated posteriorly. MESOPLEURON: evaporatorium attaining postero-lateral angle but not lateral margin of segment; lateral area with numerous oblique rugulae. METAPLEURON: terminal lobe of peritreme a large, irregular semicircle reaching almost to straight lateral margin of evaporatorium; lateral area shining, with few rugae paralleling evaporatorium. LEGS: anterior tibia with five or six stout spines dorsally. STERNITES: shining and minutely punctate medially, laterally with distinct punctures and longitudinal rugae. TERMINALIA: genital capsule finely alutaceous, more closely punctate laterally; gonostylus as illustrated (Fig. 212). LENGTH of body, 3.42 (3.30-3.56).

FEMALE:- similar to male. HEAD: length: width:: 0.56 (0.51-0.60): 0.84 (0.83-0.86); interocular width, 0.52 (0.52-0.53); antennals, I, 0.15,

(0.14-0.16): II, 0.17 (0.16-0.20): III, 0.18 (0.16-0.20): IV, 0.24 (0.23-0.26): V, 0.31 (0.30-0.33); labials, I, 0.24 (0.23-0.27): II, 0.39 (0.36-0.43): III, 0.28 (0.26-0.32): IV, 0.23 (0.23-0.26). PRONOTUM: length: width:: 0.95 (0.90-1.00): 1.82 (1.74-1.92). SCUTELLUM: length: width:; 1.34 (1.26-1.41): 1.14 (1.12-1.16). LENGTH of body, 3.45 (3.31-3.59).

TYPE DATA: The type specimen, which Uhler reported (loc. cit.) as having come from "Pennsylvania," is now in the collection of the United States National Museum. When Signoret (1883) transferred Uhler's picinus and Stal's (1853:315) Aethus picinus to Geotomus, Stal's use of the name had priority and Signoret was obliged to rename Uhler's species. He called it "pensylvanicus," using but one "n" as was in current usage in France at that time.

DISTRIBUTION: The specimens examined were all from the southern United States from Virginia to Florida west to Nebraska, Oklahoma and Louisiana.

DISCUSSION: In view of the lack of ecological comments in literature concerning this species, the following notes copied from labels of specimens examined should be especially interesting: "on okra," "swept grasses," "tanglefoot trap posts," "from soil, peach orchard" and "under litter, peach orchard."

SPECIMENS EXAMINED: UNITED STATES: Alabama: Anniston; July. Arkansas: Pike Co., Washington Co.; May, September. Florida: Pensacola; October. Georgia: Atlanta, Burnsville, DeWitt, Savannah; March, May, July. Illinois: Charleston; September. Kansas: Douglas Co., Manhattan; May, June. Louisiana: Bassier Parish, Batan Rouge, Logansport; April, May. Maryland: "Md.," Hagerstown; March, June, November. Mississippi: Gulfport, Lincoln;

April, December. Missouri: Carthage, Phelps; May, June. Nebraska: Lincoln; May. North Carolina: Moore Co., Southern Pines; July. Oklahoma: Calera; December. Tennessee: Knoxville; May. Virginia: Falls Church, Leesburg; April.

Melanaethus planifrons NEW SPECIES

DIAGNOSIS: The enlarged terminal lobe of the peritreme reaching close to the lateral edge of the evaporatorium plus the presence of three or four setigerous punctures submarginally on the head will easily separate this species from all others in the genus.

DESCRIPTION: MALE:- elongate-oval, sides parallel. HEAD:- length about three-fourths width, 0.99 (0.96-1.02): 1.22 (1.16-1.27); interocular width, 0.86 (0.82-0.90); anterior outline semicircular, juga longer than clypeus, contiguous beyond it; surface shining, nearly smooth, or with weak to prominent radiating rugae, with patches of numerous small punctures scattered on higher parts; jugum with distinct marginal carina dorsally, submarginally with row of three or four setigerous punctures; ocelli moderate, situated distinctly posterior to line connecting hind margin of strongly oblique eyes, removed from eye by space about four times transverse ocellar width; jugum ventrally and maxillary plate, except base, shining, impunctate; antennals, I, 0.30 (0.30-0.33): II, 0.39 (0.35-0.43): III, 0.37 (0.34-0.40): IV, 0.46 (0.41-0.50): V, 0.52 (0.49-0.60); bucculae as high as labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.41 (0.40-0.43): II, 0.65 (0.65-0.66): III, 0.49 (0.43-0.56): IV, 0.40 (0.37-0.43). PRONOTUM: length more than half width, 1.35 (1.17-1.44): 2.31 (2.47-2.82); anterior margin deeply, doubly emarginate; lateral margin

weakly incurved basally, then straight for more than half length, with submarginal row of six or seven setigerous punctures; transverse impression postmedian, obsolete to distinct, marked by irregular, medially-interrupted row of coarser punctures; anterior lobe with mixture of coarse and fine punctures in broad lateral band and in narrow line in moderate, subapical impression; posterior lobe with scattered minute punctures and a few distinct punctures medially. SCUTELLUM: length greater than width, 1.88 (1.69-1.97): 1.59 (1.36-1.69); shining, with several widely scattered minute and coarse punctures discally. HEMELYTRON: clavus and corium polished; clavus usually with one row of punctures; sometimes with partial second row; mesocorium with one complete and one medially interrupted row of punctures paralleling claval suture, elsewhere obsoletely or minutely punctate; exocorium with punctures of various sizes scattered along length; costa convex dorsally, with one, or rarely two, setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: weakly alutaceous to shining, with few distinct punctures in depression; prosternal carinae about as high as labial II, abruptly rounded off posteriorly. MESOPLEURON: evaporatorium reaching lateral margin of segment; lateral area shining, with few oblique rugae. METAPLEURON: terminal modification of peritreme somewhat transverse, polished only along posterior margin, distinctly separated from lateral margin of evaporatorium by space less than diameter of the lobe; lateral area polished, impunctate. LEGS: anterior tibia with six to eight stout spines dorsally. STERNITES: shining, minutely punctate, with few coarse punctures and weak, longitudinal rugae laterally. TERMINALIA: genital capsule shining, with small, shallow emargination apically;

gonostylus as illustrated (Fig. 214). LENGTH of body, 5.38 (4.79-5.77).

FEMALE:- similar to male, lacking punctate impression, subapical impression on pronotum. HEAD: length: width:: 0.98 (0.94-1.03): 1.24 (1.16-1.30); interocular width, 0.86 (0.80-0.90); antennals, I, 0.30 (0.30-0.32): II, 0.37 (0.35-0.40): III, 0.36 (0.34-0.40): IV, 0.47 (0.43-0.53): V, 0.54 (0.49-0.63); labials, I, 0.40 (0.36-0.43): II, 0.70 (0.68-0.73): III, 0.51 (0.48-0.56): IV, 0.38 (0.36-0.41). PRONOTUM: length: width:: 1.35 (1.19-1.49): 2.70 (2.47-2.93). SCUTELLUM: length: width:: 1.99 (1.85-2.18): 1.61 (1.43-1.69). LENGTH of body, 5.26 (4.81-5.82).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, "Lower California, Pacific Slope, Calexico, Cal., VI-30-40," both in collection of United States National Museum. PARATYPES: 17 males, 39 females. UNITED STATES: Arizona: Elroy, 8-4-32, E. D. Ball, 4f (USNM). Patagonia, 7-36, E. S. Ross, 1m (CalAc). Salt River Valley, Oct. 1933, A. F. Swain, Coll., 4m, 3f, 2ny (RLU). Same locality and collector, in lettuce, 1m, 1f, 2ny (CalAc). S. Luis, Yuma Co., Aug. 11, '40, E. C. Van Dyke, coll., 2f (CalAc). Tucson, St. Xavier Ms., July 29, 1924, E. P. VanDuzee collector, 1m (CalAc). California: Brawley, X-14, 1936, A. T. McClay Collector, 1f (McC). Dos Palos, Merced Co., VIII-14-1947, V. M. Stern Collector, 1m (CIS). Ft. Yuma, Aug. 21, 1924, E. P. Van Duzee Collector, 2f (CalAc). Holtville, Apr. 2-45, S. S. 24807, Sugar Beet, 45-8425, 1f (USNM). Imperial Valley, March, W. M. Davidson Collector, 1f (USNM). Los Angeles, 10-15-17, E. P. Van Duzee, 1f (CalAc). Palo Verde, Imperial Co., VIII-27, 1946, P. D. Hurd Collector, 1f (CIS). Ripley, Riverside Co., VII 26 and 27, 1946, P. D. Hurd Collector, 1m, 2f (CIS). Santa Ana Canyon, 11-2-34, 1m (IAMus). Selma, VII-17, 1947, R. C. Bechtel Collector, 1f (McC). MEXICO: Lower California: Mexixali B. C., Mex., VIII-20-42, Calexico-4129, 43-10585,

purslane leaves, 1f (USNM). 20 mi. S. Palacio, IV-39, Michener, 1m (CalAc). Sinaloa: Los Mochis, VI-27, 1922, C. T. Dodds Collector, 1m, 1f (CalAc). Same locality and collector July 4, 1922, 1m (CalAc). Sonora: Hermasillo, IV-19, 1897, Koebele Collection, 1m (CalAc). Navajoa, VIII-3-1952, C. & P. Vaurie, 1m, 2f (AmM). Obregon, VII-29-1952, 2m, 8f (CalAc).

DISTRIBUTION: This species is known from Arizona and California in the United States and from Lower California and Sonora in Mexico.

DISCUSSION: The several specimens that bore determination labels were identified as Geotomus semilevis Signoret. Because Signoret's illustration of that species shows the peritreme without a specially modified terminal lobe such application of the name cannot be supported. In the present paper semilevis is considered to be a member of the genus Dallasiellus, but falls into the group of species that the author has tentatively designated the lugubris-reversus complex.

On two occasions this insect had been collected in association with cultivated plants. Some of the Arizona specimens were labelled "in lettuce", while one California specimen was noted as having come from "sugar beet."

Melanaethus robustus Uhler REVIVED COMBINATION (Fig. 13)

1877 Melanaethus robustus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:390.

1884 Geotomus (Melanaethus) robustus Signoret, Ann. Soc. Ent. France, (6) 3:59, pl. 4, fig. 168.

1886 Melanaethus robustus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Geotomus robustus Lethierry and Severin, Gen. Catal. Hemip., 1:73.

1910 Geotomus robustus Banks, Catal. Nearct. Hemip., p. 100.

1917 Geotomus robustus Van Duzee, Univ. California Pubs. Ent., 2:22.

1939 Geotomus robustus Torre Bueno, Ent. Amer., 19:181.

DIAGNOSIS: The coarse, close punctation of the head, the intermixed coarse and fine punctation of the posterior pronotal lobe and the large size (3.6-4.2) will readily separate this species from all others of the genus that exhibit the large terminal modification of the peritreme.

DESCRIPTION: MALE:- broadly oval, widest behind midlength. HEAD: length three-fourths width, 0.62 (0.60-0.65): 0.88 (0.86-0.93); interocular width, 0.63 (0.61-0.66); anterior outline semicircular, clypeus as long as or very slightly longer than juga, scarcely narrowed apically; surface (Fig. 50) shining, with numerous coarse punctures, many of them contiguous, with distinct marginal carina dorsally, with one setigerous puncture submarginally; ocelli very small, far behind line connecting posterior margins of eyes, removed from eyes by space greater than four times transverse ocellar width; jugum ventrally shining, impunctate; maxillary plate rugopunctate; antennals, I, 0.16 (0.15-0.20): II, 0.15 (0.15-0.16): III, 0.19 (0.17-0.23): IV, 0.25 (0.23-0.27): V, 0.38 (0.36-0.40); bucculae (Fig. 23) higher than labial II, abruptly terminated posteriorly; labium attaining middle coxae, segments, I, 0.24 (0.24-0.26): II, 0.50 (0.47-0.53): III, 0.37 (0.35-0.40): IV, 0.25 (0.23-0.30). PRONOTUM: length less than half width, 0.97 (0.93-1.03): 2.01 (0.96-2.08); anterior margin moderately, singly emarginate; lateral margin straight on basal half, without submarginal setigerous punctures; transverse impression obsolete, sometimes absent medially, not marked by special row of punctures; anterior lobe, except calli and their anterior projection into the latero-apical angles, with numerous moderate to coarse, closely crowded punctures, calli with

few minute punctures; transverse impression and posterior lobe very closely punctate laterally, discally with numerous fine punctures and few to many coarse ones intermingled. SCUTELLUM: length greater than width, 1.31 (1.29-1.33): 1.19 (1.17-1.23); shining, surface, except basal angles, with numerous coarse punctures (usually with fine ones intermingled) becoming finer apically. HEMELYTRON: clavus and corium polished; clavus with one complete row of punctures and basal part of another; mesocorium with two complete rows of punctures paralleling claval suture, disc with numerous distinct punctures becoming coarser basally; exocorium irregularly, but mostly more densely punctate than mesocorium; costa wide, thin, gently reflexed to form a shallow, open trough on basal third, without setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, reaching apex of abdomen. PROPLEURON: anterior convexity with numerous close, anastomosing rugulae; with few coarse punctures in depression; prosternal carinae not as high as labial II, convexly terminated posteriorly. MESOPLEURON: (Fig. 96) evaporatorium reaching almost to lateral margin of segment; lateral area with several coarse punctures. METAPLEURON: (Fig. 96) terminal modification of peritreme large, reaching almost to lateral margin of evaporatorium; lateral area with band of numerous punctures near evaporatorium. LEGS: anterior tibia with six or seven stout spines dorsally. STERNITES: medially shining and minutely punctate, lateral fourth with small punctures and numerous short, longitudinal rugulae. TERMINALIA: genital capsule shining, almost uniformly punctate, apical margin straight, gonostylus as illustrated (Fig. 215). LENGTH of body, 3.71 (3.62-3.76).

FEMALE:- similar to male. HEAD: length: width:: 0.63 (0.59-0.67): 0.93 (0.90-0.98); interocular width, 0.64 (0.62-0.69); antennals, I, 0.19 (0.17-0.21): II, 0.17 (0.15-0.20): III, 0.22 (0.21-0.24): IV, 0.28 (0.26-0.30): V, 0.40 (0.38-0.43); labials, I, 0.27 (0.26-0.29): II, 0.55 (0.50-0.60): III, 0.38 (0.36-0.40): IV, 0.26 (0.25-0.31). PRONOTUM: length: width:: 1.06 (1.04-1.12): 2.03 (1.90-2.13). SCUTELLUM: length: width:: 1.43 (1.34-1.52): 1.15 (1.10-1.23). LENGTH of body, 3.82 (3.59-4.07).

TYPE DATA: Uhler's type specimens (1877:391) were reported as having come from "Maryland, near Baltimore. . . . Andover, Mass." The type specimens are now in the collection of the United States National Museum.

DISTRIBUTION: The specimens examined came from the eastern United States as far west as Iowa, Missouri and eastern Texas.

DISCUSSION: The only ecological note on any specimen was, "woods ground cover" on a small series from Illinois.

SPECIMENS STUDIED: 26 males, 42 females. UNITED STATES: District of Columbia: Washington; June. Florida: Dunedin; December. Illinois: Catlin, Jacksonville, Muncie, Urbana, White Heath; March, May, June, September, October, December. Indiana: Marion Co.: August. Iowa: Ames, Indianola; March, April, June. Maryland: Plummer's I.; April, August. Mississippi: Natchez; May. Missouri: Columbia, Kimmswick, New Hartford, Ranken, Springfield; June, July. New Jersey: Glouchester; June. Ohio: Delaware Co., Whitman Beach (Ashtabula Co.); June, July. Pennsylvania: Harrisburg, Jeannette, Philadelphia, Pittsburg, Washington Co.; March, September. Texas: Concho Co., Victoria; February, August. Virginia: Deer Run, Great Falls; June.

Melanaethus spinolae (Signoret) NEW COMBINATION

1863 Aethus spinolae Signoret, Ann. Soc. Ent. France, (4) 2:545, pl. 12, fig. 12.

1867 Aethus spinolai Walker, Catal. Hemip. Brit. Mus., 1:152.

1876 Aethus spinolae "loc. incert." Stal, Svenska Vet.-Ak. Handl., 14(4):27.

1877 Melanaethus spinolae Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:392.

1883 Geotomus (Cydnus) spinolai Signoret, Ann. Soc. Ent. France, (6) 3:209, pl. 4, fig. 172.

1886 Geotomus spinolai Uhler, Checklist Hemip. N. Am., p. 3.

1893 Geotomus spinolai Lethierry and Severin, Gen. Catal. Hemip., 1:74.

1926 Geotomus mimusculus Jensen-Haarup, Ent. Medd., 16:50. NEW SYNONYMY

1932 Geotomus spinolai Barber and Bruner, Jour. Dept. Agri. Puerto Rico, 16:238.

DIAGNOSIS: The small size (2.7-3.2) and the thick, almost calloused margin of the head which has no dorsal carina and is unarmed except for a single, submarginal setigerous punctures in front of eye.

DESCRIPTION: MALE:- elongate oval, sides subparallel. HEAD: length about two-thirds width, 0.52 (0.50-0.54): 0.74 (0.73-0.76); interocular width, 0.44 (0.43-0.46); anterior outline angled, side margins convex, clypeus longer than juga; margin thick, almost calloused, without dorsal carina, with one submarginal setigerous puncture next to eye; surface, including clypeus, shining, with scattered fine but distinct punctures; ocelli moderate, separated from eye by space less than twice transverse ocellar width; jugum ventrally and maxillary plate (except basally) shining, impunctate; antennals, I, 0.16 (0.15-0.18): II, 0.19 (0.16-0.20):

III, 0.21 (0.20-0.23): IV, 0.25 (0.23-0.26): V, 0.32 (0.31-0.33); bucculae about as high as labial II, abruptly terminated posteriorly; labium reaching between middle coxae, segments, I, 0.21 (0.20-0.23): II, 0.42 (0.41-0.46): III, 0.30 (0.29-0.32): IV, 0.19 (0.16-0.23). PRONOTUM: length half width, 0.70 (0.67-0.74): 1.46 (1.43-1.50); anterior margin moderately, simply emarginate; lateral margin straight on basal third, basally concealed from above by slightly swollen sides of posterior lobe, with submarginal row of four or five setigerous punctures; transverse impression submedian, obsolete to absent, not marked by special row of punctures except laterally; anterior lobe laterally with patch of fine and moderate punctures, anteriorly and mesially with fine punctures, calli with few minute punctures; posterior lobe finely punctate medially, punctures coarser towards sides. SCUTELLUM: length greater than width, 1.15 (1.15-1.16): 0.91 (0.90-0.93); surface shining, with numerous minute to fine punctures, these becoming coarser apically. HEMELYTRON: clavus and corium shining, very feebly alutaceous; clavus with one complete row of punctures and few punctures at base; mesocorium with two complete rows of punctures paralleling claval suture, disc with numerous distinct punctures; exocorium with median row of distinct, close-set punctures; costa thin, sharp, depressed, with one setigerous puncture dorsally near base; membranal suture feebly convex, lateral angle slightly produced; membrane longer than basal width, slightly surpassing apex of abdomen. PROPLEURON: anterior convexity alutaceous, with numerous obsolete to feeble punctures and rugulae, depression with several coarse punctures; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium restricted, extended two-thirds across posterior margin of segment; lateral area finely rugulose.

METAPLEURON: terminal lobe of peritreme large, almost reaching to side margin of evaporatorium; lateral area with number of close-set, elongate, coarse punctures. LEGS: anterior tibia with four stout spines dorsally. STERNITES: shining, very faintly alutaceous, minutely punctate, lateral fourth roughened by numerous small, close rugae. TERMINALIA: genital capsule shining, scattered punctures becoming numerous in depressed lateral angles, apical margin straight, with small, prominent tooth medially (sometimes broken off); gonostylus as illustrated (Fig. 216). LENGTH of body, 3.01 (2.94-3.07).

FEMALE:- similar to male. HEAD: length: width:: 0.52 (0.50-0.56): 0.75 (0.72-0.81); interocular width, 0.43 (0.40-0.47); antennals, I, 0.15 (0.15-0.16): II, 0.17 (0.16-0.20): III, 0.21 (0.17-0.25): IV, 0.25 (0.23-0.30): V, 0.34 (0.32-0.37); labials, I, 0.21 (0.20-0.23): II, 0.37 (0.36-0.40): III, 0.26 (0.23-0.30): IV, 0.23 (0.21-0.26). PRONOTUM: length: width:: 0.72 (0.70-0.76): 1.50 (1.46-1.57). SCUTELLUM: length: width:: 1.22 (1.14-1.31): 0.93 (0.90-1.00). LENGTH of body, 2.92 (2.74-3.18).

TYPE DATA: The location of the types of this species is unknown to the author. Signoret (loc. cit.) originally described it from "Chili." Jensen-Haarup (loc. cit.) described minusculus from "Lagoa Santa (Brazil)." His type specimen is now in the collection of the Universitetets Zoologiske Museum, Copenhagen, Denmark.

DISTRIBUTION: The specimen data at hand indicate the range of this species to be from Panama and the West Indies south to Chili, Brazil and Paraguay.

DISCUSSION: The few ecological comments on specimens examined were the usual "at lights," implying that these insects are active after dusk.

None of the specimens studied showed the tubercles described and figured with the original description. In fact, in his later "Revision" Signoret himself did not again mention such a modification.

The synonymizing of minusculus Jensen-Haarup with spinolai is done in the present paper on the basis of comparison of undoubted specimens of the latter with the type of minusculus. This comparison was very kindly made by Dr. S. L. Tuxen of the Universitetets Zoologiske Museum, Copenhagen. Denmark.

SPECIMENS STUDIED: 4 males, 59 females. PANAMA: Canal Zone: Ancon, Barro Colorado, Bohio, Coraza; April. DOMINICAN REPUBLIC: Barahona, S. side Lake Enriquillo; September. BRITISH GUIANA: Bartica. BRAZIL: Corumba (Matt. Grosso), Espirito-Santo, D. Federal, Rio de Janeiro; June, December. PARAGUAY: Chaco, Grand Chaco; June.

Melanaethus subpunctatus (Blatchley) NEW COMBINATION

1926 Geotomus subpunctatus Blatchley, Heterop. E. N. Am., p. 78.

1939 Geotomus subpunctatus Torre Bueno, Ent. Amer., 19:181.

DIAGNOSIS: The virtual absence of large punctures from the transverse impression and posterior lobe of the pronotum coupled with the broadly reflexed costa will separate this species from all others in the genus.

DESCRIPTION: MALE:- broadly oval, widest at midlength. HEAD: length more than half width, 0.66 (0.62-0.67): 1.00 (0.99-1.03); interocular width, 0.65 (0.63-0.69); anterior outline semicircular, often flattened, clypeus as long as juga, not much narrowed apically; surface shining, with numerous crowded punctures; with marginal carina dorsally; ocelli small, separated from eye by space nearly twice transverse ocellar width; jugum

ventrally and maxillary plate (except basally) shining, impunctate; antennals, I, 0.18 (0.16-0.20): II, 0.20 (0.17-0.23): III, 0.20 (0.20-0.21): IV, 0.23 (0.23-0.26): V, 0.30 (0.30-0.34); bucculae higher than labial II, abruptly terminated posteriorly; labium reaching between middle coxae segments, I, 0.26 (0.25-0.30): II, 0.53 (0.50-0.58): III, 0.40 (0.37-0.44): IV, 0.28 (0.25-0.33). PRONOTUM: length about half width, 1.09 (1.04-1.17): 2.12 (2.02-2.22); anterior margin deeply, doubly emarginate; lateral margin straight on basal half or two-thirds, with one submarginal setigerous puncture at apical angle or none; transverse impression obsolete to absent, not marked by special row of punctures; anterior lobe with numerous crowded, coarse punctures laterally, and in a band paralleling anterior margin, calli with scattered minute punctures; posterior lobe with widely scattered minute punctures medially, closer coarser ones laterally. SCUTELLUM: length equal to or longer than width, 1.35 (1.24-1.43): 1.27 (1.24-1.32); shining, with numerous minute punctures and very few coarse ones, both becoming more numerous towards apex. HEMELYTRON: basal width across both usually slightly wider than pronotum; clavus and corium; clavus with one row of punctures; mesocorium with one complete row of punctures, apically with minute, widely scattered punctures becoming coarser and closer towards base; exocorium explanate, at base wider than radial vein, faintly reflexed, more densely punctate than mesocorium; costa thin, sharp, without setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, almost or quite reaching apex of abdomen. PROPLEURON: anterior convexity with several irregular, longitudinal carinae and few punctures; depression with few coarse punctures; prosternal carinae about half as high as labial II, roundingly terminated posteriorly. MESOPLEURON: evaporatorium

reaching into postero-lateral angle, not attaining lateral margin of segment; lateral area with several longitudinal rugae. METAPLEURON: terminal modification of peritreme large, reaching almost to lateral margin of evaporatorium; lateral area with few rugae. LEGS: anterior tibia with six or seven stout spines dorsally. STERNITES: shining, minutely punctate, with few weak rugae and punctures laterally near spiracular area. TERMINALIA: genital capsule shining, with numerous punctures, apical margin straight; gonostylus as illustrated (Fig. 217). LENGTH of body, 3.97 (3.88-4.12).

FEMALE:- similar to male, measurements averaging larger. HEAD: length: width:: 0.64 (0.60-0.70): 1.02 (1.00-1.09); interocular width, 0.66 (0.63-0.71); antennals, I, 0.20 (0.20-0.21): II, 0.22 (0.20-0.24): III, 0.21 (0.20-0.23): IV, 0.25 (0.23-0.30): V, 0.31 (0.30-0.34); labials, I, 0.30 (0.30-0.32): II, 0.56 (0.50-0.66): III, 0.42 (0.41-0.44): IV, 0.30 (0.27-0.35). PRONOTUM: length: width:: 1.09 (1.04-1.17): 2.20 (2.14-2.34). SCUTELLUM: length: width:: 1.40 (1.36-1.50): 1.29 (1.23-1.37). LENGTH of body, 4.08 (3.91-4.35).

TYPE DATA: Blatchley (loc. cit.) described this species from Dunedin, Florida, Wilmington, North Carolina and Plum Point, Maryland. Some of these types are in the collection of the University of Purdue, Lafayette, Indiana.

DISTRIBUTION: The specimens at hand came from the southeastern and southern coastal states from Maryland south to Florida and west to Texas and up the valley of the Mississippi and Red Rivers to Arkansas.

DISCUSSION: Two of the types were reported by Blatchley (loc. cit.) to have been "sifted from vegetable debris" in Florida. The Louisiana specimens seen bore the notation, "under litter, peach orchard." Several

specimens were identified as "Geotomus robustus."

SPECIMENS STUDIED: 14 males, 20 females. UNITED STATES: Alabama: Mobile; November. Arkansas: Hope; May. Florida: Alachua Co., Gainesville, Lake Co., Sanford, Tampa; February to May and August to November. Georgia: Savannah; September. Louisiana: Bossier Par., Hart; April. Maryland: Cove Point, Plum Point; March, August. North Carolina: Southern Pines, Wilmington; April. Texas: Tyler; February. Virginia: Trammel's Landing (Potomac River); April.

Melanaethus uhleri (Signoret)

1883 Geotomus uhleri Signoret, Ann. Soc. Ent. France, (6) 3:211, pl. 5, fig. 211.

1886 Melanaethus uhleri Uhler, Checklist Hemip. N. Am., p. 3.

1893 Geotomus uhleri Lethierry and Severin, Gen. Catal. Hemip., 1:74.

1910 Geotomus uhleri Banks, Catal. Nearct. Hemip., p. 100.

1917 Geotomus uhleri VanDuzee, Univ. California Pubs. Ent., 2:22.

1939 Geotomus uhleri Torre Bueno, Ent. Amer., 19:181.

DIAGNOSIS: Among the species of Melanaethus with the large terminal modification of the peritreme this one may be recognized by the fact that the punctation on the middle of the posterior pronotal lobe is much finer than that found laterally and that the costa, which are straight and subparallel on the basal half, are neither explanate nor recurved.

DESCRIPTION: MALE:- elongate, widest behind midlength. HEAD: length two-thirds width, 0.62 (0.60-0.66): 0.96 (0.94-1.01); interocular width, 0.63 (0.63-0.66); anterior outline a flattened semicircle, clypeus very slightly longer than juga, weakly narrowed apically; juga, clypeus and

interocular space variously punctate; with fine, distinct, marginal carina dorsally; ocelli small, separated from eye by space about three times transverse ocellar width; jugum ventrally dull or shining; maxillary plate strongly alutaceous; antennals, I, 0.18 (0.17-0.21): II, 0.19 (0.16-0.22): III, 0.23 (0.22-0.24): IV, 0.32 (0.30-0.34): V, 0.36 (0.36-0.40); bucculae almost twice as high as labial II, abruptly terminated posteriorly; labium reaching middle of mesosternum, segments, I, 0.26 (0.25-0.27): II, 0.44(0.43-0.46): III, 0.30 (0.30-0.32): IV, 0.27 (0.23-0.30). PRONOTUM: length more than half width, 1.11 (1.04-1.17): 2.08 (2.02-2.15); anterior margin moderately, simply emarginate; lateral margin straight on basal third or half, with submarginal row of seven or eight setigerous punctures; transverse impression virtually absent, its post-median site not marked by special row of punctures; anterior lobe with numerous strong punctures subapically and laterally, elsewhere, with scattered minute punctures; posterior lobe minutely punctured medially, more strongly so laterally. SCUTELLUM: longer than wide, 1.42 (1.36-1.46): 1.25 (1.17-1.30) disc polished, with scattered small punctures absent in basal angles, becoming more numerous apically. HEMELYTRON: clavus and corium polished; clavus with two to three rows of punctures; mesocorium with two complete rows of punctures paralleling claval suture, large punctures of main area becoming very coarse basally; exocorium more abundantly punctate, declivent basally to flattened costa; costa without setigerous punctures; membranal suture nearly straight, lateral angle weakly produced; membrane little longer than basal width, slightly surpassing apex of abdomen. PROPLEURON: front half of anterior convexity with crowded, prominent, longitudinal rugae and few punctures; depression with few coarse punctures; prosternal carinae more than half

as high as labial II, abruptly terminated posteriorly. MESOPLEURON: evaporatorium reaching into postero-lateral angle, not to lateral margin of segment; lateral area strongly rugo-punctate anterior to evaporatorium. METAPLEURON: terminal modification of peritreme very large, semicircular, reaching lateral margin of evaporatorium; lateral area with several strong punctures. LEGS: anterior tibia with six stout spines dorsally. STERNITES: polished, minutely punctate on middle half, coarsely rugo-punctate on lateral fourth. TERMINALIA: genital capsule punctate, more closely so laterally, apical margin very weakly sinuate medially; gonostylus as illustrated (Fig. 218). LENGTH of body, 3.99 (3.91-4.09).

FEMALE:- similar to male, measurements usually averaging larger. HEAD: length: width:: 0.65 (0.65-0.66): 1.01 (1.00-1.04); interocular width, 0.68 (0.66-0.70); antennals, I, 0.21 (0.20-0.23): II, 0.20 (0.20-0.23): III, 0.25 (0.23-0.26): IV, 0.32 (0.30-0.33): V, 0.37 (0.36-0.40); labials, I, 0.28 (0.27-0.30): II, 0.44 (0.43-0.46): III, 0.35 (0.33-0.37): IV, 0.30 (0.30-0.30). PRONOTUM: length: width:: 1.18 (1.10-1.23): 2.21 (2.15-2.28). SCUTELLUM: length: width:: 1.52 (1.49-1.56): 1.34 (1.30-1.36). LENGTH of body, 4.11 (3.91-4.25).

TYPE DATA: Uhleri was described by Signoret (loc. cit.) from "Amerique du Nord." The type is probably in the Naturhistorisches Museum in Vienna.

DISTRIBUTION: The material examined showed this to be a not uncommon species in the southern United States from Alabama to Tennessee west to Arkansas and Texas.

DISCUSSION: Signoret's statement that the terminal lobe of the peritreme in this species is like that of the European Geotomus punctulatus is erroneous. The lobe here is quite typical for the present genus, being

flat, outline convex posteriorly and with osteole opening posteriorly on the peritreme, although the trough from the opening does extend onto the mesal part of the lobe.

One of the specimens from Texas was labelled as having been collected on parsnip, Pastinaca sativa. Blatchley (1926-78) reported specimens as having been "swept from herbage in low, moist meadows."

SPECIMENS EXAMINED: 6 males, 34 females. UNITED STATES: Alabama: Gadsden; May. Arkansas: Howard Co., Pike Co., Washington Co.; February, May, September. Tennessee: Hamilton Co., Roane Co.; April, May. Texas: Benchley, Brownsville, Calvert, Columbus, Denton, Devil's River, Gainesville, Kerrville; January, April, May, August.

Genus Homaloporus Uhler

1877 Homaloporus Uhler, Bull. U. S. Geol. Surv., 3:376.

DIAGNOSIS: The lack of a terminal modification on the peritreme coupled with the distinct subapical impressed line on the pronotum plus the presence of a complete (including apex of clypeus), submarginal row of coarse setigerous punctures on the head will separate the species of this genus from all others in the Western Hemisphere.

DESCRIPTION: Moderate sized, 4.4-5.4; shape oval, widest behind mid-length; dorsum slightly, venter strongly convex. HEAD: length half to three-fourths width, oblique, more or less flattened, with fine marginal carina dorsally; clypeus as long as juga, with two setigerous punctures subapically; jugum with a complete submarginal row of coarse, setigerous punctures giving rise to a row of short, stout pegs and some half dozen long hairs; ocelli small, situated on line connecting posterior margin of

eyes; antennae five-segmented, II shortest, V longest; bucculae less than half as high as labial II; labium reaching between middle coxae, IV shortest, II longest. PRONOTUM: length little more than half width; lateral margin with eighteen to twenty setigerous punctures submarginally; transverse impression near midlength distinctly impressed; anterior lobe with distinct, impressed line paralleling anterior margin, without marked subapical impression in either sex. SCUTELLUM: length and width subequal, apex narrowed, narrower than half of membranal suture; disc with widely separated sunken punctures. HEMELYTON: feebly alutaceous punctate; costa with five to ten setigerous punctures; membrane about one-third of hemelytral length, distinctly surpassing apex of abdomen. PROPLEURON: punctate only in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: (Fig. 102) flattened, somewhat depressed anteriorly; evaporatorium limited, separated from posterior margin except basally and not reaching lateral margin of segment; posterior margin entire; mesosternum swollen, ecarinate, with long fine hairs. METAPLEURON: (Fig. 102) moderately convex laterally, evaporative area extensive, lateral edge gently concave; osteolar peritreme extending to middle of segment, without a differentiated apical process, osteole opening posteriorly. LEGS: moderately long; anterior tibia (Fig. 125) compressed, not surpassing tarsal insertion, dorsal margin with eight or nine long, stout, blunt spines; middle and posterior (Fig. 152) tarsi simple, terete; tarsi three-segmented, II shortest. STERNITES: polished, impunctate.

IMMATURE STAGES: On the one available nymph (a third instar from Colorado) the submarginal row of pegs and cilia were present on the head and the spines of the posterior tibia were equally developed on all margins.

GENOTYPE: Homaloporus congruus Uhler (1877:377), monobasic.

DISTRIBUTION: The range of this genus in the Western Hemisphere is that of its only included species and extends across the southwestern quarter of the United States from Kansas to California and thence south to the middle of Mexico.

DISCUSSION: The separation between Homaloporus and Pangaeus is not as strong as might be desired, and it is only with a feeling of great conservatism that the author keeps it as a distinct genus. As indicated in the key, both agree in having the undifferentiated apex of the peritreme, the osteole opening posteriorly, a distinct, deeply impressed subapical line on the pronotum and the simple, terete posterior tibiae. They are thereby closely related. In contrast, the separation of the two groups is not convincing. The separating feature that has been used in the past is the presence, in Homaloporus, of a complete (including apex of clypeus) submarginal row of setigerous punctures around the anterior margin of the head which give rise to a complete set of pegs and several long hairs; a feature which has been said to be absent in Pangaeus. As long as no intermediate forms appeared, this proved to be a very convenient separation. But with the description of the new species Pangaeus setosus in the present paper a somewhat intermediate condition became known. As shown in Figure 49, that species has hair-like setae on the basal submargin of the head and peg-like setae on the anterior submargin of each jugum. With the gap between the two genera partly bridged it is likely that additional material will eventually close it completely. Until the author has had opportunity to make a study of certain internal features in both the males and females, he prefers to maintain this long-recognized genus. If, however, Homaloporus does fall

as a synonym of Pangaeus it will fit well into the northern subgenus of that genus on the basis of the limited mesopleural evaporatorium. The northern subgenus will then have to take Homaloporus for its name.

The two nominal species described in this genus by Signoret (1881:331) have been disposed of as follows: pangaeiformis is a synonym of congruus (see discussion under latter species) and subtilius is transferred to the genus Tominotus on the basis of the submarginal row of punctures on the head and the absence of any species with such armature which can be assigned here.

Homaloporus congruus Uhler (Fig. 10)

1877 Homaloporus congruus Uhler, Bull. United States Geol. Geogr. Surv. Terr., 3:377.

1881 Homaloporus congruus Signoret, Ann. Soc. Ent. France, (6) 1:330, pl. 10, fig. 47.

1881 Homaloporus pangaeiformis Signoret, Ann. Soc. Ent. France, (6) 1:331, pl. 11, fig. 48.

1882 Aethus ferrugineus Signoret, Ann. Soc. Ent. France, (6) 2:40, pl. 2, fig. 82.

1886 Homaloporus congruus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Aethus ferrugineus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Homaloporus congruus Lethierry and Severin, Gen. Catal. Hemip., 1:65.

1893 Homaloporus pangaeiformis Lethierry and Severin, Gen. Catal. Hemip., 1:65.

1893 Cydnus ferrugineus Lethierry and Severin, Gen. Catal. Hemip., 1:66.

1910 Homaloporus congruus Banks, Catal. Nearct. Hemip., p. 100.

1917 Homaloporus congruus VanDuzee, Univ. California Pubs. Ent., 2:19.

1917 Homaloporus pangaeiformis VanDuzee, Univ. California Pubs. Ent., 2:19.

1939 Homaloporus congruus Torre Bueno, Ent. Amer., 19:178.

1939 Homaloporus pangaeiformis Torre Bueno, Ent. Amer., 19:178.

DIAGNOSIS: This is the only species known to belong to the genus Homaloporus.

DESCRIPTION: MALE:- oval, widest behind middle. HEAD:- length about two-thirds width, 0.84 (0.82-0.90): 1.25 (1.20-1.36); interocular width, 0.85 (0.80-0.93); anterior margin a slightly flattened semicircle, clypeus as long as juga; eyes projecting by one-half their length; surface shining, nearly smooth, almost impunctate; juga ventrally and maxillary plate (except basal margin) smooth, impunctate; antennals, I, 0.24 (0.23-0.26): II, 0.22 (0.20-0.23): III, 0.26 (0.26-0.30): IV, 0.30 (0.30-0.33): V, 0.34 (0.33-0.36); bucculae (Fig. 33) about half as high as labial II, evanescent posteriorly; labials, I, 0.43 (0.40-0.50): II, 0.53 (0.50-0.60): III, 0.51 (0.46-0.60): IV, 0.33 (0.30-0.36). PRONOTUM: length slightly more than half width, 1.45 (1.30-1.69): 2.76 (2.47-3.06); anterior margin shallowly, doubly emarginate; lateral margin straight in basal two-thirds, submarginally with eighteen to twenty setigerous punctures; transverse impression somewhat postmedian, weak to obsolete marked by incomplete row of moderate punctures; anterior lobe polished, impunctate except for few moderate and many minute punctures laterally, subapically with distinctly impressed line terminated laterally at setigerous puncture posterior to inner margin of eye; posterior lobe with few scattered moderate to fine punctures discally and laterally. SCUTELLUM: length subequal to width, 1.70 (1.56-1.82): 1.70 (1.56-1.82); discally with numerous scattered punctures similar to those of posterior pronotal lobe; apically with punctures finer, more numerous. HEMELYTRON:

clavus and corium shining, very finely alutaceous; clavus with median row of punctures and usually a partial row either side; mesocorium with two complete rows of punctures paralleling claval suture, discally with numerous moderate punctures becoming coarser towards base; exocorium similarly punctate on apical half; costa with five to ten setigerous punctures; membranal suture straight, lateral angle little produced; membrane longer than basal width, surpassing apex of abdomen by about half its length. PLEURAE:(Fig. 102) as described for genus. STERNITES: alutaceous, impunctate, slightly rugose laterally. TERMINALIA: genital capsule weakly alutaceous, closely punctate in lateral angle, apical margin straight; gonostylus as illustrated (Fig. 219). LENGTH of body, 4.80 (4.42-5.20).

FEMALE:- similar to male, measurements averaging slightly larger. HEAD: length: width:: 0.88 (0.86-0.93): 1.37 (1.33-1.40); interocular width, 0.93 (0.90-0.96); antennals, I, 0.26 (0.26-0.26): II, 0.21 (0.20-0.23): III, 0.30 (0.28-0.31): IV, 0.29 (0.26-0.33): V, 0.35 (0.33-0.36); labials, I, 0.41 (0.40-0.44): II, 0.55 (0.53-0.56): III, 0.44 (0.41-0.50): IV, 0.32 (0.30-0.33). PRONOTUM: length: width:: 1.50 (1.43-1.56): 2.95 (2.86-3.00). SCUTELLUM: length: width:: 1.82 (1.75-1.89): 1.82 (1.75-1.89). LENGTH of body, 4.96 (4.85-5.14).

TYPE DATA: The types of this species, which are now in the collection of the United States National Museum, were described by Uhler (1877:378) from "the vicinity of Denver City, Colo. . . . . taken in Dallas County, Texas." The location of the type of Signoret's Homaloporus pangaeiformis is unknown to the author, but the species was described (loc. cit.) from "Mexique." The type locality of Aethus ferrugineus Signoret (1882:40) was also given as "Mexique;" the type specimen is housed in the collection of

the Naturhistorisches Museum in Vienna, Austria.

DISTRIBUTION: Specimens of this species were seen for the area from Kansas west to California and south into central Mexico.

The type of Homaloporus pangaeiformis Signoret has not yet been located, but the author feels no misgivings in here assigning it to synonymy. Considering first Signoret's comparison of this with congruus: the more oval and broader form that he ascribes to pangaeiformis may be a sexual difference, but in the series of congruus at hand there was noticeable variation in robustness of both sexes sufficient to include Signoret's figures (47 and 48) of both species. The descriptive statement that the mesopleuron has no shining space between the evaporatorium and the posterior margin of the segment is not borne out by the figure which shows that area to have a different surface texture. Other features that he listed, the evanescent, acute apex of the peritreme appears to have no specific value in this genus as it occurs on North American material almost as freely as does the abrupt termination. The other differences mentioned are definitely not of specific value here. But returning to Signoret's illustration of the meso- and metapleuron of pangaeiformis (fig. 48), one notices that something is amiss as the osteolar peritreme appears to be located on the mesopleuron--a condition unknown in this or any other family of the Hemiptera.

Discovery of this erroneous detail crystallized the author's suspicions that Signoret worked by comparison with his own illustrations which appear to have been done without reference to the specimens once the preliminary sketches had been made. This permitted Signoret to misinterpret his own sketch when finishing the drawing. Then, in comparing additional material with his figures he could not help but find differences. Examination of

the types of several other cydnids described by Signoret and comparison of them with the illustrations supported this contention.

Aethus ferrugineus Signoret (1882:40) is here placed as a synonym of congruus Uhler as a result of study of the female type made available by the generous cooperation of Dr. Max Beier, Naturhistoriches Museum Vien. The type, labelled "Bilimek, Mexico, 1871, Chapultepec," is in good condition, lacking only antennals IV and V on each side, the right middle leg and all or part of the tarsi from the left front and middle leg and the right hind leg; most of the pubescence is also still present.

That Signoret's species belongs to Homaloporus as described by Uhler, Signoret himself and subsequent authors is beyond doubt. The type does not agree with the original description in having the anterior pronotal margin "faiblement margine," but instead shows a sharply defined, well impressed, subapical groove. The head also possesses a submarginal row of coarse, setigerous punctures giving rise to short, stout pegs and several long cilia; and the osteolar canal lacks a differentiated terminal lobe.

Other discrepancies between the type and the original description may be noted here: (1) "lobe median. . . sans points piligeres" is not wholly true, although the cilia are missing, the punctures are quite evident; (2) the lateral pronotal row of setigerous punctures does not number thirteen or fourteen, but actually eighteen with a complete set of like number of cilia on the right side and a full set of punctures and nearly a full set of cilia on the left side; (3) costal setigerous punctures are nine on the right side and eight on the left.

With his original description of congruus Uhler gave the following interesting notes concerning capture of specimens:

> . . . . and a few specimens occurred to me while collecting insects near the foothills of the Rocky Mountains, west of Denver, in August, 1875. The summer was a particularly rainy one, and the sudden chilling of the atmosphere by a hail storm would cause this insect, together with beetles, flies, Hymenoptera, and other Hemiptera, to take refuge under the tufts of grass and roots of Yucca and other flowers and herbs, where they remained secure from the driving elements.

Among the specimens which bore names were some correct and some incorrect identifications. The latter included such determinations as Pangaeus piceatus, Aethus conformis and Aethus sp.

SPECIMENS STUDIED: 18 males, 21 females, 1 third instar nymph. UNITED STATES: Arizona: Oak Creek; December. California: Laguna Beach, Lone Pine, Los Angeles, Riverdale, San Diego, Santa Cruz, Wilmington; April to August. Colorado: Cortez, Cottonwood, Denver, Fort Collins, Palisades, Salida; April to July, October, 3rd instar nymphs in July. Kansas: Greeley Co., Thomas Co. New Mexico: Estancia, Mesilla Park, Santa Fe Co.: July, August. Utah: Brigham, St. Geo.; February, August. MEXICO: Distrito Federal: Quadelupe Hidalgo; July. Mexico: Amecameca.

Genus Pangaeus Stal

1862 Pangaeus Stal, Stett. Ent. Zeit., 1862:95.

DIAGNOSIS: The presence of a distinct, impressed, subapical line on the pronotum and the presence of but one or at most an incomplete row of setigerous punctures submarginally on the juga will separate this genus from all other genera of Cydnidae.

DESCRIPTION: Size small to medium, oval, widest approximately at or slightly behind middle; dorsum much less convex than venter. HEAD: (Figs. 24, 46-49) distinctly broader than long, dorsum distinctly depressed to moderately convex; juga as long as or longer than clypeus and more or less

convergent in front of them, with a fine, marginal carina above, submargin with one to six setigerous punctures, these not forming a complete row from eye to apex of jugum; eyes large, moderately projecting; ocelli well developed, located on or behind a line connecting hind margins of eyes; antennae five-segmented, II usually shortest, V longest; bucculae low, usually not as high as labial II; labium reaching between middle coxae, II longest, slightly compressed but not foliaceously lobed, IV shortest. PRONOTUM: wider than long, distinctly narrowed from near base; side margins carinate, submarginal row of five to nine setigerous punctures; anterior margin moderately to slightly concave, with a collum distinctly limited posteriorly by a sharply impressed line extending from one anterior angle to the other (even when punctured this line is distinct across its full width); transverse impression submedian, usually rather distinct and with a row of punctures; posterior margin broadly, shallowly convex; all angles rounded. SCUTELLUM: longer than wide, triangular; apex narrowed, width less than half length of membranal suture; disc sparsely to abundantly punctured. HEMELYTRON: corial areas well-defined; membranal suture straight, lateral angle somewhat acute; costa with one to twelve setigerous punctures; membrane not over two-fifths of hemelytral length, surpassing apex of abdomen. PROPLEURON: impunctate or with few punctures in depression; prosternal carinae low, distinct. MESOPLEURON: flattened; evaporatorium either entire (Fig. 104) and reaching uninterrupted into postero-lateral angle of segment (subgenus Pangaeus) or limited (Fig. 103) laterally and posteriorly and not reaching into postero-lateral angle (subgenus Boreopangaeus). METAPLEURON: (Figs. 103, 104) flattened; osteole opening posteriorly on peritreme; latter not surpassing middle of segment, apex

not differentiated; evaporatorium occupying mesal two-thirds of segment, outer margin variously concave; polished lateral space impunctate. LEGS: moderately long; anterior tibia (Fig. 127) compressed, with nine to ten stout spines dorsally, not or only slightly surpassing tarsal insertion; middle and posterior tibiae usually slender, later modified in shape and spine arrangement in males of several species (Figs. 153-159). STERNITES: alutaceous to polished; with one or two lateral submarginal setigerous tubercles; sutures entire or finely denticulate.

GENOTYPE: Aethus margo Dallas (1851), subsequent designation by VanDuzee (1914:378). The name margo, as well as several others have been found to be synonyms of Westwood's serripes. This same conclusion was also reached in independent investigation by Dr. Reece Sailer. Further data on this synonymy can be found in the discussion of serripes.

DISTRIBUTION: A New World genus, Pangaeus ranges throughout North America from southern Canada (Provancher, 1886) south through Central America and the West Indies into South America as far south as Argentina and Uraguay. The two "species," douglasi and scotti that Signoret described (1882) from Australia and New Zealand respectively may or may not have been correctly labelled. Study of the types of both of these species show that they were based on undoubted specimens of the common North American species bilineatus (Say). For further discussion of this see the remarks under Pangaeus bilineatus.

DISCUSSION: The combination of the two features given in the diagnosis above set this genus apart so sharply from other cydnid genera except Homaloporus that it is somewhat surprising to find that there has been some confusion concerning its limits. The confusion actually started

with Uhler's (1877) assignment of his discrepans to the genus with the remark, "the transverse line interrupted in the middle, remotely, coarsely punctate." The type of discrepans has no collum or limiting impressed line. Thus, Uhler's statement that the line was "interrupted" has been misleading. Not only was discrepans carried thusly as a Pangaeus, but another species without a collum was described and erroneously assigned to the genus by Blatchley (1929). Blatchley did, however, recognize that both of these species were in the wrong genus and suggested that a change would have to be made. In the present study, both of these species have been transferred to the genus Dallaiellus.

From the studies on which this revision was based, from the paper in which Distant (1899) attempted to clarify the status of Walker's several species and from a close examination of Signoret's (1881-1883) "Revision" it is clearly evident that there has been excessive splitting of species in this genus. Many of the early workers apparently assumed that every specimen from a new locality represented a new species - giving little or no thought to the possibility of widespread species. Others based their descriptions on teneral or badly mutilated specimens or over emphasized minor differences. The resulting confusion can be cleared away only by a drastic synonymizing of names. The synonymy of the present study is based on three sources: 1) a study of the types (both of Stal's and nine of Signoret's thirteen types) which were available for study; 2) the original descriptions; and finally 3) Distant's (1899) paper referred to above. The latter author himself is not known for extremely careful work, but until detailed examinations of the types in the British Museum can be made it is expedient to accept Distant's conclusions.

The genus Pangaeus is readily divisible into two groups which the author chooses to designate subgenera. One occurs from Guatemala northward and the other, containing the genotype, occurs from Mexico southward. They are most reliably separated by the shape of the mesosternal evaporatorium. The northern subgenus, for which the name Boreopangaeus is here proposed, has the evaporatorium very restricted, it being separated from the postero-lateral area (Fig. 103); while the southern subgenus, nominal Pangaeus, has the evaporatorium extending all the way across the posterior margin of the segment into the postero-lateral angle (Fig. 104). Boreopangaeus, in most of its species, has more setigerous punctures laterally than does nominal Pangaeus. In the former subgenus all species except rugiceps bear two or more submarginal setigerous punctures distad of the preocular one; and all normally have two or more costal setigerous punctures. In nominal Pangaeus all but four closely allied species of the dozen included forms have no setigerous punctures distad of the preocular one; and with two exceptions, the number of costal setigerous punctures is usually one or two with only occasional specimens showing three—the exceptions being aethiops and xanthopus, each of which has five to ten such punctures.

The shape of the mesopleural evaporatorium alone furnishes the most reliable feature for separating these subgenera and permits the forming of the following couplet:

Key to the Subgenera of Pangaeus

1. Mesopleural evaporatorium extending uninterrupted along posterior margin of segment into postero-lateral angle (Fig. 104). . . . . .Pangaeus Pangaeus p.

Mesopleural evaporatorium limited, separated from postero-lateral angle and posterior margin of segment by polished area (Fig. 103). . . . . Pangaeus Boreopangaeus p.

Subgenus Boreopangaeus NEW SUBGENUS

DIAGNOSIS: The limited mesopleural evaporatorium (Fig. 103) which does not reach to the lateral margin of the segment sets this genus apart from the nominal subgenus.

DESCRIPTION: The generic description as modified by the notes in the generic discussion will furnish sufficient description for this subgenus.

SUBGENOTYPE: Cydnus bilineatus Say (1825:315), present designation.

DISTRIBUTION: Boreopangaeus occupies the northern part of the range of the genus from Guatemala north to the United States where it is known to occur as far north as New York, Iowa and Nebraska east of the Great Plains and west from Texas across New Mexico and Arizona into southern California.

DISCUSSION: The name of this new subgenus is formed to indicate the fact that its range is northern--boreal + Pangaeus. Boreopangaeus, although possessing the specialized subapical impressed line on the pronotum, is suggestive of the subgenus Pseudopangaeus of Dallasiellus in several characters. Further information on these similarities is included in the Discussion under that subgenus.

Pangaeus rugiceps Horvath might be considered somewhat intermediate between this subgenus and the nominal one on the basis of the reduction of the number of setigerous punctures on the submargin of the head and costa. However, the shape of the mesopleural evaporatorium, which the author

considers a better phylogenetic indicator, clearly places it in the subgenus Boreopangaeus.

Key to the Species of Pangaeus (Boreopangaeus)

1. Ventral surface of posterior femur with numerous scattered, small tubercles (Fig. 154); posterior tibia of male distinctly angulate ventrally near base (Fig. 15) 2

   Posterior femur not tuberculate ventrally; posterior tibia of male simple, not angled ventrally near base 3

2. Submargin of head with double set of setigerous punctures, those on anterior third or half giving rise to short pegs, on posterior half giving rise to long hairs (Fig. 49). . setosus NEW SPECIES p. 216

   Submargin of head with four or five setigerous punctures giving rise to long slender hairs (similar to Fig. 47). . . . . tuberculipes NEW SPECIES p. 220

3. Juga with three or more setigerous punctures submarginally; surface of head neither strongly reflexed nor strongly rugose. 4

   Jugum with one submarginal setigerous puncture immediately anterior to eye; dorsum of head strongly convex, usually with strong, transverse rugae (Fig. 48). . . . . .rugiceps Horv. p. 213

4. Subapical impressed line of pronotum with a row of distinct punctures; corium not alutaceous. . . . punctilinea NEW SPECIES p. 211

   Subapical impressed line of pronotum impunctate; corium distinctly alutaceous. . . . . bilineatus (Say) p. 198

Pangaeus bilineatus (Say)

1825 Cydnus bilineatus Say, Jour. Acad. Nat. Sci. Philadelphia, 4:315.

1839 Cydnus rugifrons Herrick-Schaeffer, Wanzen. Insecten, 5:97, pl. 177, fig. 547.

1839 Cydnus femoralis Herrick-Schaeffer, Wanzen. Insecten, 5:98, pl. 177, fig. 548.

1851 Aethus bilineatus Dallas, List Hemip. Brit. Mus., 1:119.

1867 Aethus bilineatus Walker, Catal. Hemip. Brit. Mus., 1:150.

1867 Aethus femoralis Walker, Catal. Hemip. Brit. Mus., 1:150.

1867 Aethus rugifrons Walker, Catal. Hemip. Brit. Mus., 1:150.

1867 Aethus fortis Walker, Catal. Hemip. Brit. Mus., 1:151.

1868 Aethis ? femoralis Walker, Catal. Hemip. Brit. Mus., 3:534.

1876 Pangaeus bilineatus Stal, Svenska Vet.-Ak. Handl., 14(4):19.

1876 Pangaeus femoralis Stal, Svenska Vet.-Ak. Handl., 14(4):19.

1876 Cydnus rugifrons "loc. inc." Stal, Svenska Vet.-Ak. Handl., 14(4):26.

1877 Pangaeus bilineatus Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:383.

1877 Pangaeus rugifrons Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:384.

1877 Pangaeus ? fortis, Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:389.

1880 Pangaeus bilineatus Distant, Biol. Centr.-Amer., Rhynch., 1:6.

1880 Pangaeus rufifrons [lapsus] Distant, Biol. Centr.-Amer., Rhynch., 1:7.

1880 Pangaeus fortis Distant, Biol. Centr.-Amer., Rhynch., 1:6.

1882 Pangoeus [!] fortis Signoret, Ann. Soc. Ent. France, 2:246, pl. 8, fig. 105.

1882 Pangoeus [!] Uhleri Signoret, Ann. Soc. Ent. France, 2:253, pl. 9, fig. 112.

1882 Pangoeus [!] bilineatus Signoret, Ann. Soc. Ent. France, 2:254, pl. 9, fig. 113.

1882 Pangoeus [!] vicinus Signoret, Ann. Soc. Ent. France, 2:255. NEW SYNONYMY.

1882 Pangoeus [!] Douglasi Signoret, Ann. Soc. Ent. France, 2:258, pl. 9, fig. 115. NEW SYNONYMY

1882 Pangoeus [!] Scotti Signoret, Ann. Soc. Ent. France, 2:259, pl. 9, fig. 117. NEW SYNONYMY

1882 Pangoeus [!] Spangbergi Signoret, Ann. Soc. Ent. France, 2:259, pl. 9, fig. 116. NEW SYNONYMY

1886 Pangaeus bilineatus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Pangaeus fortis Uhler, Checklist Hemip. N. Am., p. 3.

1886 Pangaeus rugifrons Uhler, Checklist Hemip. N. Am., p. 3.

1886 Pangaeus Uhleri Uhler, Checklist Hemip. N. Am., p. 3.

1893 Pangaeus bilineatus Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1893 Pangaeus Douglasi Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1893 Pangaeus fortis Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1893 Pangaeus rugifrons Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus Scotti Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus Spangbergi Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus Uhleri Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus vicinus Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1910 Pangaeus bilineatus Banks, Catal. Nearc. Hemip., p. 100.

1910 Pangaeus spangbergi Banks, Catal. Nearc. Hemip., p. 100.

1910 Pangaeus uhleri Banks, Catal. Nearc. Hemip., p. 100.

1917 Pangaeus spangbergi VanDuzee, Univ. California Pubs. Ent., 2:21.

1917 Pangaeus bilineatus VanDuzee, Univ. California Pubs. Ent., 2:21.

1917 Pangaeus uhleri VanDuzee, Univ. California Pubs. Ent., 2:21.

1939 Pangaeus bilineatus Torre Bueno, Ent. Amer., 19:180.

1939 Pangaeus spangbergi Torre Bueno, Ent. Amer., 19:180.

DIAGNOSIS: As can be deduced from the key to species, bilineatus is probably best characterized within the subgenus mostly by negative characters: 1) no tubercles on ventral surface of posterior femora, 2) no punctures in subapical impression of the pronotum; and 3) the presence of three or more submarginal setigerous punctures on each jugum.

DESCRIPTION: MALE:- oval, widest behind the middle. HEAD: length about two-thirds of width, 1.20 (1.03-1.26): 1.76 (1.58-1.87); interocular width, 1.09 (0.96-1.16); anterior outline a full semicircle or less, usually evenly curved; clypeus usually as long as juga, little narrowed apically; jugum submarginally with three to five setigerous punctures, usually with feeble to obsolete radiating rugae; surface somewhat convex, punctures obsolete or absent; ocelli moderately large, separated from eye by a space less than twice transverse ocellar width; jugum ventrally and maxillary plate (except basally) polished, impunctate; antennals, I, 0.34 (0.28-0.40): II, 0.32 (0.27-0.43): III, 0.40 (0.30-0.46): IV, 0.47 (0.34-0.56): V, 0.50 (0.36-0.60); bucculae almost as high as labial II; labium reaching between middle coxae, segments, I, 0.60 (0.50-0.66): II, 0.90 (0.73-1.00); III, 0.73 (0.70-0.78): IV, 0.46 (0.36-0.50). PRONOTUM: length more than half of width, 2.04 (1.69-2.28): 3.73 (3.24-3.97); anterior margin moderately, simple emarginate; side margins entire, nearly straight on middle third, lateral submarginal row of nine to twelve setigerous punctures; transverse impression submedian, obsolete to absent, impunctate or marked by irregular row of distinct punctures; anterior lobe impunctate or sometimes with few (one to five) weak punctures laterally; posterior lobe impunctate or with few to a dozen punctures medially. SCUTELLUM: length equal to or slightly longer or

shorter than width, 2.31 (1.95-2.53): 2.32 (2.02-2.47); surface obsoletely alutaceous (not polished), with numerous punctures discally except across base and at extreme apex. HEMELYTRON: corium and clavus distinctly alutaceous; clavus usually with one or two partial rows of distinct punctures; mesocorium with one complete and a second partial or complete row of punctures paralleling claval suture, disc obsoletely, rarely distinctly punctured; exocorium with numerous punctures usually more distinct than those of mesocorial disc; costa with two to six setigerous punctures; membranal suture weakly bisinuate, lateral angle slightly produced; membrane longer than basal width, distinctly surpassing apex of abdomen. PROPLEURON: distinctly alutaceous, punctured only in depression; prosternal carinae less than half as high as labial II, acute. MESO- and METAPLEURON: as in Fig. 103. LEGS: moderately long; posterior femora not tuberculate ventrally; posterior tibiae not angulate ventrally near base. STERNITES: distinctly alutaceous, impunctate. TERMINALIA: genital capsule alutaceous, punctured laterally, apical margin weakly emarginate medially; gonostylus as illustrated (Fig. 220). LENGTH of body, 6.87 (5.85-7.46).

FEMALE:- very similar to male. HEAD: length: width:: 1.14 (0.88-1.30): 1.72 (1.33-1.94); antennals, I, 0.34 (0.28-0.40): II, 0.32 (0.27-0.43): III, 0.40 (0.30-0.46): IV, 0.47 (0.34-0.56): V, 0.50 (0.36-0.60); labials, I, 0.53 (0.41-0.63): II, 0.87 (0.63-1.03): III, 0.69 (0.43-0.81): IV, 0.49 (0.41-0.54). PRONOTUM: length: width:: 1.97 (1.61-2.30): 3.55 (2.22-4.23). SCUTELLUM: length: width:: 2.22 (1.69-2.47): 2.26 (1.69-2.61). LENGTH of body, 6.64 (5.25-7.78).

TYPE DATA: Cydnus bilineatus was described by Say (loc. cit.) with the comments, "Inhabits the United States. . . . Not uncommon in Pennsylvania as well as in Missouri." Say's collection, and therefore probably

most of his types have been destroyed. There are, however, in the T. W. Harris collection (now housed in the Museum of Comparative Zoology at Harvard) a number of specimens which Say determined for Harris. Since very few Say-determined specimens are still in existence, these generally have been accepted as sort of substitutes for the type of Say's species. Of this collection Uhler (1878:365) stated:

> This collection is of especial interest at the present time, because it is the only one preserved in this country which contains original and authentic types of the Hemiptera described by Mr. Say.

Specimen No. 135 in the Harris collection bears the data, "Florence, Ala., January and February, 1836, Prof. Hentz." Of it Uhler (1878:371) wrote, "Having examined the type of Dr. Fitch, I am enabled to refer it to this species." As indicated by the year of collection quoted above, this specimen cannot be the original type because it was not captured until some ten years after the description appeared.

The location of the types of Herrick-Schaeffer's (loc. cit.) two species, Cydnus femoralis and C. rugifrons, is not known to the author. Femoralis was described from "aus Lankaster [Pennsylvania?] in Nordamerika"; rugifrons "aus Georgian in Amerika."

Aethus fortis was described by Walker (1867:151) from "Oajaca," Mexico. The type is in the British Museum of Natural History.

As indicated in the synonymy of the species, Signoret (1882) described five forms which he thought to be distinct from bilineatus. They were: Douglasi from "Australie;" Scotti from "Nouvelle-Zelande;" Spangbergi from "Texas;" Uhleri from "Caroline et Georgia;" and vicinus from "Guayaquil." The types of Douglasi and Scotti are in the

Naturhistorisches Museum in Vienna; that of spangbergi is in the Riksmuseum in Stockholm. The location of the type of vicinus, which was described from "Guayaquil," is not known to the author. It is apparently not in the major Signoret collection in Vienna. Since uhleri was proposed for those specimens from South Carolina and Georgia which Uhler (1877:385) had determined as rugifrons of Herrick-Schaeffer, those Uhler specimens must comprise the type lot. These specimens are in the Uhler collection in the United States National Museum.

DISTRIBUTION: The range indicated by specimens studied extended across the eastern half of the United States from Massachusetts south to Florida and Bermuda, west to South Dakota, Nebraska, Kansas, Oklahoma and Texas, thence through Arizona into southern California, and south into Lower California, Mexico and Guatemala. The type localities of Signoret's two synonyms, douglasi and scotti, were given as "Australie" and "Nouvelle-Zeland." These countries are not here considered to be part of the established distribution of the species. Fuller discussion of this matter is given below.

DISCUSSION: The extensive range occupied by bilineatus brings it under many and varying environmental conditions. In adapting to these conditions the insect may be expected to show several modifications. Such variation occurs and was recognized and noted by Uhler as early as 1877 in his "Monograph." In material seen during the present study these variations were present in bewildering array. The anterior outline of the head varied from a full semicircle to a flattened one; the surface of the head from smooth and impunctate to distinctly but weakly rugose (rugifrons H-S) with scattered fine punctures; the number of the submarginal setigerous punctures

on each jugum ranged from three to five. The number of these setigerous punctures may have some significance, but variability included unlike numbers on the two sides of one individual as well as unlike numbers on specimens from the same locality, especially as the material from farther north was studied. In contrast to this, the southern material appeared to have a tendency toward few and more regularly arranged submarginal punctures, until in Mexican specimens each jugum usually has one or two close-set punctures immediately anterior to the eye and two more widely separated one beyond. Antennal II, while usually shorter than III, sometimes was subequal to it.

Pronotal punctation showed variation in the number and size of punctures laterally on the anterior lobe, medially on the posterior lobe and in the transverse impression. The number of costal setigerous punctures ranged from two to five, not uncommonly differing in number on the two sides of one specimen. The shape of the lateral margin of the metapleural evaporatorium was almost straight in some individuals and weakly to strongly concave in others. The length of the body shows great difference between the smallest and largest specimens seen, 5.25 to 7.78 mm.; the smaller specimens were all from the southern part of the range, with the smallest being from Bermuda. But not all southern specimens were small, many of them were as large as any of the northern ones, and all intermediate sizes exist so that the name uhleri (Signoret) is not necessary for the smaller specimen.

Depending on the maturity of the individual at the time of its death, the color varied from yellowish-brown through reddish-brown and piceus (var. a. picea Say) to black with the legs, particularly the femora often

being reddish-brown (femoralis H-S). These above-mentioned variations have been confusing, but since nearly any one of them may be found in any part of the range, there can be no other conclusion but that only one quite variable species is involved.

The application of the name bilineatus Say employed here is that commonly followed by all other workers: considered as the common species of the eastern United States. Since most of Say's collection has been destroyed, it is quite probable that the type of bilineatus was destroyed with it. This leaves the species without a type, but since the presently used assignment is so universally adopted there can be little objection to continuing the practice. Although Signoret apparently intended to follow this plan, his illustration on pl. 14, fig. 113 of his "Revision" shows one important difference from all specimens of the species seen during this study. No specimen showed the quadrate terminal appendage to the osteolar peritreme. Without doubt, this misrepresentation aided Signoret in separating several "new species" from bilineatus. Considering in order those doubtful new Signoret species of which Signoret material was available for study, the reasons for synonymyzing the names follow:

Herrick-Schaeffer's (loc. cit.) two species, Cydnus rugifrons from "Georgien in Amerika" and Cydnus femoralis from "Lankaster in Nordamerika," were described from individual variants as indicated in the present discussion of the variation that occurs in this species (supra).

Walker (loc. cit.) described his species, Aethus fortis, from "Oajaca," Mexico. This locality, the large size (6.8) and the presence of "stout bristles" along the sides of the head, while not fully diagnostic in itself, excludes most species of Pangaeus from consideration. Additional data were

given by Signoret (1882:246) who saw the type in the British Museum. He stated that there were four submarginal setigerous punctures on the head and three on the costa, and that the mesopleural evaporatorium occupied half of the segment. This combination of features is encompassed by only one species seen during the present study, namely, bilineatus.

Pangaeus vicinus Signoret (loc. cit.), "Guayaquil." A female specimen in the Signoret collection at the Naturhistorisches Museum, Vienna, is labelled "vicinus det Signoret," but does not bear a type label. In addition, the specimen is labelled as being from "Mexico," not from the type locality given in the original description. In view of the description of the limited mesopleural evaporatorium of vicinus and the fact that the present study saw no members of the subgenus Boreopangaeus from the South American continent the "Guayaquil" locality appears to be in error. The Mexican locality is included within the presently determined range of the subgenus. Assuming, at least temporarily, that Signoret's determination represents his concept of vicinus, one is confronted with certain discrepancies between the specimen and the original description. In the latter he points out the similarity to bilineatus and reports a difference in the apex of the peritreme--a character already shown (supra) to be non-existent in bilineatus. He recorded a single costal seta, where the Mexican specimen shows three setigerous punctures. His description of the cephalic bristles is of the primary setae, not of the submarginal setigerous punctures which give rise to four close-set punctures immediately anterior to the eye and one more widely removed beyond. This Mexican specimen also lacks antennals II to V so the characters pertaining thereto cannot be verified, but the described condition fits the variations accepted for bilineatus in the

present study. The description of the punctation of the pronotum, scutellum, corium and venter agrees both with the Mexican specimen and bilineatus as here understood. Since discrepancies of this sort are numerous in Signoret's cydnid work—even where the type itself was available for study—one should not attach too much importance to them. So, with apparently no characters for separating vicinus from bilineatus the former must be considered a synonym of the latter.

Pangaeus douglasi Signoret (loc. cit.) "Australie" and Pangaeus scotti Signoret "Nouvelle-Zeland." Although these two species were described from areas well-removed from the native range of the genus, examination of the types loaned by the Naturhistorisches Museum, Wien, leaves no doubt of their synonymy with bilineatus. Signoret was undoubtedly misled by the distant localities and his own error in figuring the apex of the peritreme of bilineatus. Excluding the character of the peritreme, neither description nor type offers any discrepancy between bilineatus and these two forms. Two possible explanations may be offered for the remote type localities. The simplest is that the specimens were mislabelled. The second is that the specimens may have been carried to these localities by commerce. Being burrowers, they could easily be scooped into the holds of ships with soil that was added for ballast and then be unloaded to make room for a cargo; or they could have travelled in soil about the roots of plants. In either event, neither species appears to have been reported from their original type locality by subsequent authors, except on the authority of Signoret's original description. There is, however, in the collection of the Museum of Comparative Zoology at Harvard University a specimen labelled as coming from the Society Islands. Although no further data are given on the label,

this record plus those of Signoret's two species lend plausibility to the theory that bilineatus can be readily transported by commerce.

Pangaeus spangbergi Signoret (loc. cit.) "Texas." The type specimen, property of the Riksmuseum, Stockholm, Sweden, was loaned for study and proved to be a Belfrage specimen from "Texas." Signoret's comparison of this with P. moestus, a member of the nominal subgenus, apparently misled him into describing his specimen as new. His illustration, Cydnides Pl. XIV. Fig. 116, does not agree with the type in the following respects: 1) head has submarginal setigerous punctures arranged four close-set in front of eye and one more widely spaced beyond, not as pictured; 2) on the pronotum the lateral punctures are much fewer in number and the postero-lateral angles are neither so prominent nor sharp as shown; 3) apex of scutellum is shown too long and narrow; 4) hemelytron of type has only one row of punctures on clavus, fewer and more irregularly spaced punctures on mesocorium and more punctures on exocorium; 5) both evaporatoria are misrepresented: mesopleural evaporatorium shown as acute, while it is rounded in the type, and that of metapleuron does not extend to antero-lateral margin of segment as shown in the figure; and 6) the posterior emargination of the peritreme does not show the large hook-like blade visible in the illustration. The author was unable to find any feature to separate the type from bilineatus.

The name Pangaeus uhleri was proposed by Signoret (loc. cit.) for the Carolina and Georgia specimens which Uhler (1877:385) had identified as rugifrons (Herrick-Schaeffer). Uhler's use of rugifrons was in the same sense that it had been proposed, for a species of the southeastern United States. Thus uhleri must be considered as a synonym of rugifrons which in turn is considered to be the same as bilineatus. Signoret's transfer of

the name rugifrons to a Mexican species was erroneous, so Horvath (1919: 236) proposed the name rugiceps for the Mexican form.

As with most other species in the family, the biology and ecology of this insect is poorly known. The author's experience with it is that it may be quite common in an area and still be rarely collected. Intensive field work in St. Louis, Missouri, and adjacent territory had yielded less than a half dozen specimens in more than twenty years, and these always from under debris on the ground. Yet, when it became possible to examine the miscellaneous insect material collected in the Japanese beetle traps in the St. Louis area, several times that many specimens would be seen in one week. Apparently, these insects had been attracted to the eugenol or geranol that had been used as an attractant for the Japanese beetles. Judging from certain published notes, this species may be quite injurious to cultivated plants. Cassidy (1939:322) reported them as doing "serious damage to cotton" in Arizona. In the same year, Tissot (1939:445) reported "pepper seed beds at Fort Myers, Florida being severely damaged. Beds mulched with grass and weeds, which probably was the cause of the bugs congregating in such large numbers."

SPECIMENS STUDIED: 648 specimens. UNITED STATES: Alabama: Auburn, Burnesville, DeSoto St. Pak, Florala, Mobile, Tuscaloosa Co.; April to July. Arkansas: Hope, Hot Springs, Washington Co.; July, October. Arizona: Alamo Canyon (Pima Co.), Baboquivari Mts., Buckeye, East Fort Lowell, Globe, Oracle, Patagonia, Phoenix, Sabino Canyon, Thatcher, Tucson; June to September. California: Holtville, Indio, Palm Springs, Riverside; May, June. Florida: Alachua Co., Cocoanut Grove, Crescent City, Deerfield, DeLand, Ft. Lauerdale, Ft. Meyers, Fruitville, Gainesville, Hollywood, Homestead, Juniper Sprs.,

LaBelle, Lakeland, Lake Placid, Liberty Co., Miami, Moore Haven, Okechobee, Palm Beach, Plant City, Quincy, Royal Palm Park, Zolfo Springs; all months. Georgia: Atlanta, Bainbridge, Billy's Island (Okefenokee Swamp), Bueno Vista, DeWitt, Eaton, Pamona, St. Simmon's Island, Thomasville, Vidalia; April to November. Illinois: Ashmore, Catlin, Charleston, Collinsville, Olive Branch, Urbana; March, April, July to October. Indiana: Hanover, Harrison Co., Terre Haute; May to August. Iowa: Ames, Kelso, Muscatine, Pleasant Valley; April to September. Kansas: Baldwin, Douglas Co., Lawrence, Leavenworth, Onaga; May to July. Louisiana: Baker, Buras, Creole, Harahan, New Orleans; June to August. Maryland: Plummer's Island, September. Masaachusetts: "Massachusetts." Mississippi: Handsboro, Jackson; August. Missouri: Aldrich, Carthage, Columbia, Gray Summit, Kansas City, Kirkwood, Perry Co., St. Louis, Van Buren; April to August. Nebraska: Crete Inn. New Jersey: Palisades, Snake Hill; October. New York: Ithaca, Long Island, New York, Sea Cliff; May, July. North Carolina: Ashville, Black Mt. City. Edenton, McDowell Co.; May to August. Oklahoma: Alva, Hobart, Osage Co., Payne Co., Smithville; May to September. Pennsylvania: Chestnut Hill, Jeannette, Philadelphia; July, September. South Carolina; Aiken Co., Blaney, Charleston, Clemson, Florence, Fort Jackson, Spartanburg; May to September. South Dakota: Elk Point; August. Tennessee: Knoxville, Reelfoot Lake; April, May. Texas: Abiline, Aransas Co., Brazoria Co., Brownsville, Cedar Lane, Colorado City, Colorado Co., Corpus Christi, Dallas, Del Rio, Devil's River, Harlingen, Hidalgo Co., Lake Kemp, Navasota, Palacios, Peeler, San Angelo, San Antonio, Three Rivers, Uvalde, Waco; April to August. Virginia: Falls Church, Great Falls; May to July, October. West Virginia: Cheat Mts., Jackson's Mill, Lewis Co. MEXICO: Coahuila:

Monclova, San Pedro de Colonias (3700'); August. Durango: Nobre de Dios (5900'); August. Distrito Federal: El Guard, Penon de Marquis; March, November. Guerrero: Balzas, Iquala; September. Hidalgo: Guerrero Mills, Tizayuca, November. Jalisco: Guadalajara; February. Lower California: Comondu, Miraflores, San Domingo, Triunfo; July. Mexico: Tejupilco; June. Michoacan: El Sabine, 12 mi s Tzitzio on Hetamo rd.; July. Morelos: Cuernavaca; May, November. Puebla; n slope, 11,000', Mt. Popocatepetl; November. Vera Cruz; Lococos, Minatitlan; February, July. GUATEMALA: Zacapa: Zacapa; February, July. BERMUDA: "Bermuda;" May.

Pangaeus (Boreopangaeus) punctilinea NEW SPECIES

DIAGNOSIS: The row of distinct punctures in the subapical impressed line of the pronotum will permit easy recognition of this species within the subgenus.

DESCRIPTION: (described from three females) FEMALE:- oval, sides subparallel, faintly widened behind midlength. HEAD: length almost two-thirds of width, 0.97 (0.96-1.00): 1.54 (1.51-1.61); interocular width, 1.05; anterior outline a somewhat flattened semicircle, clypeus as long as juga and slightly narrowed at apex; surface weakly convex, polished, with numerous minute punctures and several radiating weak rugae on each jugum; submarginal setigerous punctures somewhat variable in arrangement, two or three close-set punctures with two more widely separated ones beyond, or four close-set punctures with one widely separated puncture distally; ocelli very small, separated from eye by a space equaling four to five transverse ocellar diameters; jugum ventrally and maxillary plate (except base) shining, impunctate; antennals, I, 0.30 (0.30-0.31): II, 0.33

(0.32-0.34): III, 0.35 (0.34-0.36): IV, 0.44 (0.43-0.46): V, 0.51 (0.49-0.54); bucculae about half as high as labial II; labium reaching between middle coxae, segments, I, 0.54 (0.51-0.56): II, 0.85 (0.83-0.90): III, 0.67 (0.64-0.70): IV, 0.50 (0.50-0.50). PRONOTUM: anterior margin moderately, doubly emarginate; side margins faintly convex on basal half, more strongly so on apical half, with submarginal row of seven to nine setigerous punctures; transverse impression postmedian, obsolete, absent medially, marked by narrow, irregular band of distinct punctures; anterior lobe distinctly punctures in complete, subapical impressed line, with few to many distinct punctures laterally, discally with numerous obsolete, minute punctures; posterior lobe medially with few coarse and numerous minute punctures, laterally with few coarse punctures. SCUTELLUM: length subequal, longer or shorter than width, 1.77 (1.75-1.82): 1.80 (1.74-1.82); disc polished, discally with numerous large punctures except at base and apex. HEMELYTRON: clavus and corium polished; clavus with one, nearly complete row of distinct punctures; mesocorium with two complete rows of punctures paralleling claval suture, discally with numerous small punctures scattered full length; exocorium with numerous distinct punctures scattered for full length; costa with two setigerous punctures; membranal suture nearly straight, lateral angle weakly produced; membrane longer than basal width, distinctly surpassing apex of abdomen. PROPLEURON: shining, with few punctures in depression and antero-ventral angle; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium reaching posterior margin for more than half its length; lateral area rugo-punctate. METAPLEURON: evaporatorium with lateral margin straight; lateral area with row of obsolete, broad punctures adjacent to edge of evaporatorium. LEGS: posterior femora not tuberculate

ventrally. STERNITES: shining, with few punctures and longitudinal rugae laterally. LENGTH of body, 5.57 (5.45-5.78).

TYPE DATA: HOLOTYPE: female, "Brownsville, Texas, Wickham, col. C. F. Baker," in the collection of the United States National Museum. PARATYPES: Esper Rch, Brownsville, Texas, Catal. No. 19, Brooklyn Museum Coll. 1929, 1f (RCF); Harlingen, Tex., 25 mi. S. E., 9-21-45, E. Hardy, Nest of Neotoma micropus BD., 1f (JAS).

DISTRIBUTION: All the above type material came from Cameron County, the southernmost county in Texas.

DISCUSSION: It might be desirable to point out once again that the subapical transverse impression of the pronotum, while distinctly punctured is never-the-less complete from one side of the pronotum to the other.

Pangaeus (Boreopangaeus) rugiceps Horvath

1882 Pangaeus rugifrons Signoret (nec Herrick-Schaeffer, 1839:97), Ann. Soc. Ent. France, 1882: 252, pl. 9, fig. 111.

1919 Pangaeus rugiceps Horvath, Ann. Mus. Nat. Hungarici, 17: 236.

DIAGNOSIS: At present, this is the only Boreopangaeus with a single submarginal setigerous puncture in front of an eye.

DESCRIPTION: MALE:- oval, widest at or slightly behind midlength. HEAD: length more than two-thirds of width, 1.17 (1.10-1.26): 1.59 (1.52-1.70); interocular width, 0.99 (0.95-1.06); anterior outline an elongated semicircle, juga longer than apically narrowed clypeus and nearly or quite contiguous beyond it; juga impunctate, with strong, mostly transverse rugae, submarginally with one setigerous puncture anterior to eye; ocelli moderately large, separated from eye by space somewhat greater than transverse ocellar width; jugum ventrally in large part rugo-punctate; maxillary plate,

polished, impunctate; antennals, I, 0.28 (0.26-0.30): II, 0.29 (0.26-0.32): III, 0.39 (0.36-0.43): IV, 0.42 (0.42-0.44): V, 0.46 (0.44-0.49); bucculae about half as high as labial II; labium reaching between middle coxae, segments, I, 0.52 (0.48-0.56): II, 0.84 (0.80-0.93): III, 0.64 (0.60-0.68): IV, 0.46 (0.40-0.50). PRONOTUM: length more than half of width, 1.90 (1.75-2.02): 3.35 (3.06-3.55); anterior margin shallowly, doubly emarginate; lateral margins straight to very slightly sinuate opposite ends of transverse impressions, with six submarginal setigerous punctures; transverse impression weak, obsolete at middle, marked by medially interrupted, irregular row of coarse punctures; surface elsewhere impunctate except for prominent punctures laterally on anterior lobe and a few medially on posterior lobe. SCUTELLUM: length equal to, longer or shorter than width, 2.10 (1.92-2.22): 2.09 (1.89-2.28); surface polished, basal third to fourth impunctate, disc with several widely-scattered coarse punctures and numerous interspersed minute punctures, latter extending to apex. HEMELYTRON: clavus and corium shining, very weakly alutaceous; clavus with a partial row of punctures; membranal suture slightly bisinuate, lateral angle vaguely produced; membrane longer than basal width, distinctly surpassing apex of abdomen. PROPLEURON: vaguely alutaceous, with no distinct punctures; prosternal carinae less than half as high as labial II, sharp. MESOPLEURON: lateral area finely alutaceous, impunctate. METAPLEURON: evaporatorium moderately concave laterally; lateral area weakly alutaceous, impunctate. LEGS: posterior femora not tuberculae ventrally; posterior tibiae not angulate ventrally near base. STERNITES: shining, vaguely alutaceous, impunctate but with fine longitudinal rugae in spiracular area. TERMINALIA: genital capsule rugo-punctate laterally, finely punctured elsewhere, apical

margin weakly sinuate medially; gonostylus as illustrated (Fig. 221). LENGTH of body, 6.11 (5.60-6.71).

FEMALE:- very similar to male. HEAD: length: width:: 1.23 (1.10-1.36): 1.87 (1.56-1.84); interocular width, 1.05 (0.96-1.16); antennals, I, 0.30 (0.37-0.33): II, 0.30 (0.28-0.33): III, 0.41 (0.36-0.46): IV, 0.44 (0.40-0.50): V, 0.46 (0.43-0.50); labials, I, 0.53 (0.50-0.60): II, 0.95 (0.86-1.03): III, 0.79 (0.63-1.16): IV, 0.56 (0.49-0.73). PRONOTUM: length: width:: 2.07 (1.89-2.34): 3.61 (3.16-4.11). SCUTELLUM: length: width:: 2.19 (1.82-2.60): 2.25 (1.95-2.53). LENGTH of body, 6.53 (5.93-7.22).

TYPE DATA: Signoret (loc. cit.) misapplied the name rugifrons of Herrick-Schaeffer (now shown to be a synonym of Pangaeus bilineatus (Say)) to a specimen from "Mexique." Horvath (1919:236) called attention to this error and proposed the new name Pangaeus rugiceps for this Mexican specimen which thus becomes the type of rugiceps. The specimen was originally in Signoret's own collection.

DISTRIBUTION: Specimens from Guatemala and the southern two-thirds of Mexico have been studied.

DISCUSSION: Signoret's erroneous application of Herrick-Schaeffer's name is quite understandable, especially if he had only very limited material of bilineatus and thus was not aware that individuals of bilineatus did show rugae on the head. The figure of rugifrons, especially in rugae and outline of the head, is very suggestive of the present species. The type locality, however, precludes the employment of that name for this species.

SPECIMENS STUDIED: Chiapas: Escuintla; February. Guerrero: Balzas, Iquala; September. Jalisco: Colima Vulcano. Morelos: Alpuyeca; June.

Nuevo Leon: Monterrey (1700'); June. Oaxaca: Tuxtepec. Sinaloa: Venodio. GUATEMALA: Chiquimula: Chiquimula (1000'); July. Zacapa: Zacapa (600'); July. EXTRA-LIMITAL SPECIMENS: UNITED STATES: Louisiana: "ex. airplane" from "Mexico."

Pangaeus (Boreopangaeus) setosus NEW SPECIES

DIAGNOSIS: This species may be recognized within the subgenus by the presence of numerous tubercles on the ventral surface of the posterior femur (Fig. 154) in combination with a partial, submarginal row of setigerous punctures on the anterior half or more of the head (Fig. 49).

DESCRIPTION: MALE:- oval, somewhat parallel-sided. HEAD: almost two-thirds of width, 1.18 (1.06-1.26): 1.84 (1.71-1.95); interocular width, 1.17 (1.06-1.26); anterior outline elongate, weakly truncate semicircle, juga longer than and nearly or quite contiguous beyond apex of clypeus; surface shining, with numerous minute punctures and partial, radiating rugae; jugum depressed discally, with four or five setigerous punctures submarginally in front of eye and on apical half a partial row of close-set setigerous punctures giving rise to a row of short, stout pegs (Fig. 49); ocelli small, situated behind line connecting hind margins of eyes, removed from eye by more than two times a transverse ocellar width; jugum ventrally and maxillary plate shining, impunctate; antennals, I, 0.40 (0.38-0.46): II, 0.52 (0.50-0.60): III, 0.55 (0.46-0.66): IV, 0.69 (0.60-0.76): V, 0.75 (0.70-0.83); bucculae about as high as labial II, obliquely terminated posteriorly; labium reaching between middle coxae, segments, I, 0.60 (0.57-0.60): II, 1.04 (1.01-1.10): III, 0.94 (0.90-1.01): IV, 0.54 (0.50-0.56). PRONOTUM: length more than half of width, 2.14 (2.02-2.26): 4.03 (3.82-4.26); anterior

margin moderately, simply emarginate; lateral margin entire, broadly and shallowly curved, with nine or ten setigerous punctures submarginally; transverse impression obsolete to absent, marked by very irregular row of scattered punctures; anterior lobe impunctate except for lateral patch of about one dozen course punctures with minute punctures interspersed; posterior lobe with few moderate punctures medially and laterally. SCUTELLUM: longer than wide, 2.66 (2.53-2.79): 2.53 (2.34-2.73); disc polished, with numerous coarse, usually foveate punctures becoming finer toward apex. HEMELYTRON: clavus and corium shining; clavus with one row of punctures; mesocorial surface slightly uneven, punctures in one row paralleling claval suture and closely set on basal half, apically the punctures are much finer and sparser; exocorium obsoletely to distinctly punctate for full length; costa with two to four setigerous punctures; membranal suture straight, lateral angle distinctly produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: shining, punctate ventrally in depression and anterior to acetabulum; prosternal carinae less than half as high as labial II. MESO- and METAPLEURAE: similar to Fig. 106 but peritreme abruptly terminated apically. LEGS: posterior femur with numerous small tubercles on ventral face; postero-ventral margin of hind tibia with a finely crenulate basal emargination and a strong angulation distad of it (as in Fig. 153). STERNITES: shining, impunctate except in trichobothrial area. TERMINALIA: genital capsule finely and sparsely punctate medially, closely and coarsely so laterally, apical margin with broad, shallow emargination medially; gonostylus as illustrated (Fig. 222). LENGTH of body, 7.89 (7.38-8.38).

FEMALE:- similar to male, but without modification of posterior tibia. HEAD: length: width:: 1.18 (1.13-1.23): 1.87 (1.75-2.00); interocular width, 1.16 (1.11-1.23); antennals, I, 0.41 (0.40-0.43): II, 0.54 (0.50-0.60): III, 0.55 (0.50-0.60): IV, 0.70 (0.70-0.72): V, 0.76 (0.70-0.79); labials, I, 0.57 (0.53-0.64): II, 1.10 (1.03-1.16): III, 0.94 (0.90-1.00): IV, 0.53 (0.49-0.56). PRONOTUM: length; width:: 2.31 (2.12-2.60): 3.97 (3.71-4.29). SCUTELLUM: length; width:: 2.72 (2.53-2.93): 2.40 (2.28-2.53). LENGTH of body, 7.79 (7.18-8.31).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, "Oracle, Ariz., 11-III-1919, 4500 ft.," both in the collection of the Museum of Comparative Zoology at Harvard University. PARATYPES: UNITED STATES: Arizona: same data as types, 3m 8f (MCZ, RCF); same locality as types, 3-7, 2m, labelled Pangaeus bilineatus Uhl. det. O. H.[eidemann] (USNM); Dry Cn. Sands Ranch, S. E. end Whetstone Mts. Cochise Co., Ariz., 10. VIII. 52, H. B. Leech and J. W. Green Collectors, 1m (CalAc); Mt. Lemon, road, 6,000 ft., Santa Catalina Mts., Ariz., XII-27-37, E. C. Van Dyke Collector, 2m 1f (CalAc); Benson, Ariz., VI-7-30, G. Linsley Collector, 1m (CalAc); Santa Rita Mts., Ariz., 5 to 8000 ft., July, F. H. Snow, 1m (KU); Catal. Spgs., Ar., 27-4, 1f (USNM); Baboquivari Mts., Ariz., VII-24-41, R. H. Beamer, 1f (KU); same locality, 11-8-36, E. D. Ball, 1f (USNM); Paradise, Ariz., VII-22-14, 1m (USNM); Douglas, Ariz., W. W. Jones, 1f (USNM). Texas: Presidio Co., Tex., 7-16-1927, R. H. Beamer, 2m 2 f (KU); El Paso, Tx., VII-18-32, 1m (RLU); Chisos Mts., Tex., Brewster Co., July 16, 1921, C. D. Duncan Collector, 1f (CalAc); Big Bend Park, Chisos Mts., Tex., July 5, 1942, H. A. Scullen Col., 1m (USNM); Marathon, Tex., C. M. Hamilton, 1m (USNM); Davis Mts., Tex., VI-29-46, E. C. Van Dyke Collector, 1f (CalAc); Valentine, Tex.,

July 13, 1927, P. A. Readio, 2f (KU). MEXICO: Chihuahua: Canon Prieto nr. Primavera, Chih., Mex., VII-2-47, 6500-6800 ft., D. Rockefeller Exp., Michener.

DISTRIBUTION: The type material listed above came from Arizona and Texas in the southwestern United States and Chichuahua in northern Mexico.

DISCUSSION: This species and the next comprise a pair of forms which are well separated from the other species of the subgenus by several characters: 1) the coarse crenulations on the posterior margin of the mesopleuron; 2) the very deeply concave side margin of the metapleural evaporatorium which permits the lateral area to reach almost or quite to the apex of the peritreme; 3) the convex ventral surface of the posterior femur with the numerous small tubercles on the distal half; and 4) the peculiar shape of the males' hind tibia (Fig. 153) the postero-ventral margin of which shows a finely crenulate emargination basally and a strong angulation just beyond. The two forms are very close and when more material from northern Mexico is studied it may be found that they represent two forms of a single species. At present, however, they appear separable on the basis of the key character pertaining to the vestiture of the head and the generally separate ranges.

These forms also suggest a possible direction of evolution of the genus Hemaloporus, which contains but one species separable from the subgenus Boreopangaeus only on the basis of the complete submarginal row of close-set setigerous punctures which give rise to short stout pegs and a few interspersed hair-like setae. The development of a partial row of such pegs as exhibited by setosus might be considered an intermediate step and lead to suggesting setosus as an ancestral or intermediate species. Such a conclusion could not be maintained against the contradictory strong modifications

of the metapleural evaporatorium and the posterior legs, these not appearing in Homaloporus.

How these two, strongly marked species could remain so long without being described is difficult to explain. This condition reflects the uncertainty that has existed pertaining to the limits of species within the group and leading to many misidentifications.

Pangaeus (Boreopangaeus) tuberculipes NEW SPECIES

DIAGNOSIS: The presence of numerous small tubercles on the ventral face of the posterior femur (Fig. 154) coupled with the lack of a submarginal row of short stout submarginal pegs on the anterior half of the head will separate this species from all others within the subgenus.

DESCRIPTION: MALE:- oval, somewhat parallel-sided. HEAD: length two-thirds of width, 1.22 (1.13-1.31): 1.80 (1.71-1.96); interocular width, 1.20 (1.10-1.26); anterior outline a full semicircle; juga longer than and nearly or quite contiguous anterior to clypeus; surface shining, with numerous distinct, radiating rugae; jugum depressed medially, with four to six coarse, setigerous punctures submarginally, without short, stout pegs; ocelli small, situated well behind line connecting posterior margins of eyes, removed from eyes by about three times transverse ocellar width; jugum ventrally shining, impunctate; maxillary plate impunctate, alutaceous on basal half; antennals, I, 0.39 (0.33-0.43): II, 0.46 (0.43-0.53): III, 0.52 (0.46-0.56): IV, 0.65 (0.60-0.70): V, 0.70 (0.69-0.73); bucculae as high as labial II, obliquely terminatedposteriorly; labium reaching between middle coxae, segments, I, 0.55 (0.53-0.57): II, 1.00 (0.88-1.07): III, 0.83 (0.71-0.93): IV, 0.52 (0.46-0.58). PRONOTUM: length more than half of width, 2.22

(2.08-2.37): 3.98 (3.78-4.16); anterior margin moderately, doubly emarginate; lateral margin entire, broadly and shallowly curved, with ten submarginal setigerous punctures; transverse impression obsolete to absent, marked by very irregular row of scattered punctures; anterior lobe impunctate except for lateral patch of about one dozen coarse punctures with minute punctures interspersed; posterior lobe with few moderate punctures medially and laterally. SCUTELLUM: length greater width, 2.67 (2.47-2.86): 2.40 (2.27-2.58); disc polished, with a number of irregularly scattered large punctures. HEMELYTRON: clavus and corium shining; clavus with one row of punctures; mesocorial surface slightly uneven, punctures in one row paralleling claval suture and closely set on basal half, apically the punctures are much finer and sparser; exocorium obsoletely to distinctly punctate for full length; costa with two to five setigerous punctures; membranal suture straight, lateral angle distinctly produced; membrane longer than basal width, distinctly surpassing apex of abdomen. PROPLEURON: shining, punctate ventrally in depression and anterior to acetabulum; prosternal carinae much less than half the height of labial II. MESO- and METAPLEURAE: similar to Fig. 106 but peritreme abruptly terminated apically. LEGS: posterior femur with numerous small tubercles on ventral face; postero-ventral margin of hind tibia with a finely crenulate basal emargination and a strong angulation distad of it (Fig. 153). STERNITES: shining, impunctate except in spiracular area. TERMINALIA: genital capsule distinctly punctate except for broad middle line, apical margin broadly, shallowly emarginate medially; gonostylus as illustrated (Fig. 223). LENGTH of body, 7.83 (7.50-8.25).

FEMALE:- similar to male, but without modification of posterior tibia.

HEAD: length: width:: 1.24 (1.20-1.30): 1.87 (1.78-1.98); interocular width, 1.25 (1.20-1.30); antennals, I, 0.37 (0.32-0.40): II, 0.49 (0.43-0.60): III, 0.53 (0.46-0.60): IV, 0.69 (0.60-0.80): V, 0.74 (0.70-0.80); labials, I, 0.53 (0.50-0.56): II, 1.03 (0.96-1.18): III, 0.82 (0.76-0.93): IV, 0.53 (0.50-0.57). PRONOTUM: length: width:: 2.23 (2.08-2.42): 4.07 (3.76-4.43). SCUTELLUM: length; width:: 2.77 (2.61-2.97): 2.44 (2.34-2.66). LENGTH of body, 7.74 (7.20-8.52).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, "5 mi. N. Tizayuca, Hgo., Mex., XI-13-46, E. S. Ross Collector," both in the collection of the California Academy of Sciences. PARATYPES: MEXICO: same data as holotype, 5m, 8f (CalAc, USNM, RCF); 15 Mi. S, El Guarda, D. F., Mex., XI-14-46, E. S. Ross Collector, 1m 2f (CalAc); N. Slope, 11,000', Mt. Popocatepetl, Mexico, XI-20-46, E. C. VanDyke Collector, 1m 3f (CalAc); Penon del Marquis, nr. Mexico City, Mex., 27-III, Wheeler coll, 1m 4f (MCZ); Guerrero Mills, Hidalgo, Mex., W. M. Mann, 1m 1f (MCZ); Bilimek, Mexico, 1883, II, Guadalu., 1m 1f (Wien); Minatitlan, Mex., Feb. 1, '92, H. Osborn Collector, 1m, labelled Pangaeus rugifrons H-S., Pangaeus confusus Sign., and Pangaeus discrepans Uhl. (USNM); Pedregal, D. F., Mexico, VI-29-32, 1f (RLU); Cuernavaca, Mex., 5-17-98, 1f (ISC); Lomas de Chapultepec, D. F., Mexico, VII-14-32, 1f (RLU); Penon Viejo, D. F., Mexico, VI-21-32, 1f (RLU). UNITED STATES: Devils Riv., Tx., V-6-07, at light, Bishop and Pratt Coll., 1f (USNM); Colorado City, Tex., 7-17-1927, L. A. Stephenson, 1f (KU).

DISTRIBUTION: Nearly all of the specimens studied were from a limited area across the middle of Mexico from Vera Cruz to Jalisco. The two specimens from elsewhere were both from southern Texas, a locality for which the author declines to attempt an explanation until more material is

available for study from northern Mexico.

DISCUSSION: This form is discussed with the preceding species.

Subgenus Pangaeus Stal

1862 Pangaeus Stal, Stett. Ent. Zeit., 1862:95.

DIAGNOSIS: The key character concerning the extensiveness of the mesopleural evaporatorium is the most reliable feature for separating this subgenus from Boreopangaeus.

DESCRIPTION: The generic description as modified by the notes in the generic discussion will furnish sufficient description for this subgenus.

SUBGENOTYPE: Aethus margo Dallas (1851:116), subsequent designation by Van Duzee (1914:378); this name is a synonym of Cydnus serripes Westwood (1837:19) which is treated in the present paper as a member of the genus Pangaeus. For explanation of this synonymy see the discussion under Pangaeus serripes.

DISTRIBUTION: The range of the nominal subgenus occupies the southern part of the range of the genus, overlapping the range of Boreopangaeus to the north for a short distance in Guatemala and southern Mexico.

DISCUSSION: The problems encountered in this subgenus were somewhat different from those found in most other parts of the family. The males of all forms were rather easily separated with the aid of secondary sexual characters, but not all the females have, as yet, proved deciferable. Therefore, as indicated in the key to species, females of certain species cannot yet be properly separated from their cogenors. This situation results from the great variability of external features in the females which either prevent establishment of reasonable limits to the species as

indicated by the males, or results in the separation of a disproportionate and unbelievable number of forms. Therefore, until later studies of the internal genitalia are made, the author deems it best to treat only such females as lend themselves to ready association with males through possession of common characters.

Key to the Species of Pangaeus (Pangaeus)

1. Posterior tibia with spines of postero-ventral margin conspicuously longer, thinner and sharper than those on dorsal margin (Fig. 159); head transversely convex, basal half or more of jugum with several distinct, coarse, transverse rugae. 2

   Posterior tibiae with spines equally developed on all margins; head flattened, jugum with broad, shallow, longitudinal impression medially. 3

2. Costa with ten or more setigerous punctures; tibiae and femora concolorous. . . . . aethiops (Fab.) p. 227

   Costa with five or less setigerous punctures; basal third or more of hind tibia and apices of femur yellow, distinctly lighter than greater part of femur. . . . . xanthopus Sign. p. 263

3. Jugum with four setigerous punctures submarginally (Fig. 47). 4

   Jugum with one or two submarginal setigerous punctures. 7

4. Anterior pronotal lobe laterally with broad patch of numerous distinct, moderately coarse punctures. 5

   Anterior pronotal lobe impunctate or with less than half dozen distinct punctures. 6

5. Pronotum with subapical impressed line and midline of anterior lobe distinctly punctate (Fig. 74). . . . . .punctinotum n. sp. p. 248

Pronotum with subapical impressed line and middle of anterior lobe impunctate; calli posteriorly with numerous small rugae (Fig. 73). . . . . rugonotum n. sp. p. 255

6. Costa with one setigerous puncture; transverse impression of pronotum sharply impressed across full width. . . . . quadrisetosus n. sp. p. 249

Costa with three or four setigerous punctures; transverse impression of pronotum weakly impressed or interrupted at middle. . . . . rufobrunneus J.-Haar. p. 253

7. Males 6

Females 16

8. Posterior tibia ventrally with distinct, subbasal angulation, with one to three subapical spines on postero-ventral margin (Figs. 155, 156). 9

Posterior tibia ventrally without subbasal angulation, postero-ventral margin with four or more spines (Fig. 157, 158) 11

9. Apex of genital capsule with broad, deep, U-shaped emargination (Fig. 177). . . . . .serripes (Westw.) p. 257

Apex of genital capsule not emarginate, sometimes gently sinuate. 10

10. Costa with two setigerous punctures; larger, length of body, 6.22 (5.84-6.60). . . . . impressus n. sp. p. 233

Costa with one setigerous puncture; smaller, length of body, 5.13 (4.21-5.56) . . . . . .docilis (Walk.) p. 231

11. Costa with two (rarely three) setigerous punctures. 12

Costa with one setigerous puncture 14

12. Corium distinctly alutaceous (at 15X); larger, length of body, 5.8-7.1. . . . . neogeus n. sp. p. 240

Corium polished, not alutaceous (at 30X); smaller, length of body, 5.0-5.3. 13

13. Jugum with two submarginal setigerous punctures, one immediately anterior to eye and one near apical third. . .bisetosus n. sp. p.229

Jugum with one submarginal setigerous puncture just anterior to eye. . . . . moestus (Stal) p.238

14. Posterior tibia with four strong spines on postero-ventral margin . . . . . piceatus Stal p.242

Posterior tibia with more than four strong spines on postero-ventral margin 15

15. Corium polished, with two complete (or nearly complete) rows of mesocorial punctures paralleling claval suture; smaller, length of body, 4.8-5.7. . . . . .quinquespinosus n. sp. p. 251

Corium distinctly alutaceous, with one complete row of mesocorial punctures paralleling claval suture; larger, length of body more than 7. . . . . laevigatus Sign. p. 235

16. Ocelli large, separated from eye by space not greater than transverse ocellar width . . . . . serripes (Westw.) p. 257

Ocelli smaller, separated from eye by space not less than one-and-one-half times transverse ocellar diameter . . . (to date the author has been unable to prepare a key which will satisfactorily separate the females which run here)

Pangaeus (Pangaeus) aethiops (Fabricius)

1787 Cimex aethiops Fabricius, Mant. Insectorum, 2:296.

1803 Cydnus aethiops Fabricius, Syst. Rhyng., p. 186.

1868 Aethus ? aethiops Walker, Catal. Hemip. Brit. Mus., 1:534.

1876 Pangaeus aethiops Stal, Svenska. Vet.-Ak. Handl., 14(4):19.

1882 Pangoeus [1] aethiops Signoret, Ann. Soc. Ent. France, 2:245, pl. 8, fig. 104.

1893 Pangaeus aethiops Lethierry and Severin, Gen. Catal. Hemip., 1:69.

DIAGNOSIS: The abundant setigerous punctures on the costa (ten or more) set this species apart from all others in the genus.

DESCRIPTION: (from one male) MALE:- broadly oval, basal halves of costa straight, subparallel. HEAD: length about two-thirds width, 1.10: 1.51; interocular width, 1.00; anterior outline a slightly prolonged semi-circle, clypeus as long as juga and narrowed at apex; surface convex, shining, with scattered minute punctures and numerous distinct, coarse, radiating rugae; jugum with four setigerous punctures submarginally; ocelli moderately large, separated from eye by about twice transverse ocellar width; jugum ventrally and maxillary plate shining, impunctate; antennals, I, 0.32: II, 0.20: III, 0.35: IV, 0.30: V, 0.36; bucculae lower than labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.50: II, 0.88: III, 0.69: IV, 0.35. PRONOTUM: length little more than half width, 1.82: 3.51; anterior margin shallowly, sihgly emarginate; lateral margin entire, posterior part hidden from dorsal view by somewhat swollen umbones, with sixteen setigerous punctures submarginally; transverse impression submedian, weak, marked by medially interrupted, regular row of large punctures; anterior lobe without large punctures, midline narrowly

depressed between calli; posterior lobe with three discal patches of a few punctures each. SCUTELLUM: length about four-fifths of width, 1.82: 2.21; disc polished, with irregularly scattered, large punctures except at base and apex. HEMELYTRON: clavus and corium finely alutaceous; clavus with one row of punctures; mesocorial punctures obsolete except those in impressed row and basal half of second row paralleling claval suture; exocorium without distinct punctures; costa with ten or eleven setigerous punctures; membranal suture virtually straight, lateral angle faintly prolonged; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: faintly alutaceous, impunctate; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate. METAPLEURON: lateral margin of evaporatorium weakly concave; lateral area impunctate. LEGS: tibiae and femora unicolorus; hind tibia curved, spines of postero-ventral margin longer, thinner and more tapering than those of dorsal margins (Fig. 159). STERNITES: shining, impunctate except for a single row of setigerous punctures across II and a double row across III. TERMINALIA: genital capsule with very sparse, fine punctures becoming slightly more numerous laterally, apical margin with broad, very shallow punctures medially; gonostylus as illustrated (Fig. 224). LENGTH of body, 5.59.

TYPE DATA: The type, the location of which is unknown to the author, was stated by Fabricius (loc. cit.) to be from "Cajennae," in French Guiana.

DISTRIBUTION: The single specimen studied was one from the Uhler collection labelled simply, "Montevideo," undoubtedly referring to the town of that name in Uraguay.

DISCUSSION: The status of the name Cimex aethiops Fabricius (loc.

cit.) has been a subject of controversy which is not yet settled. Until comparison can be made with the Fabrician type, the present study will accept the conclusions of Stal (1868:7) who assigned it to Pangaeus. Most subsequent authors have followed this approach to the problem without clearly defining the insect with which they associated the name. Signoret (1882: 245), however, clearly indicated by description and illustration the species to which he was applying the name. The single specimen examined during this study was from the Uhler Collection in the United States National Museum and bore the locality label, "Montevido," thus agreeing not only with Signoret's description, but also in locality of origin. This locality is far removed from the original type locality in French Guiana on the northeastern coast of South America and so may be wrongly applied here, especially since no northern specimens of this form have been reported or seen.

For additional comments on this species, one may consult the discussion under Pangaeus xanthopus Signoret.

Pangaeus (Pangaeus) bisetosus NEW SPECIES

DIAGNOSIS: The presence of two submarginal setigerous punctures on a jugum (one next to eye, one at apical third) will separate this species from all others in the subgenus.

DESCRIPTION: (based on one male) MALE:- oval, widest near midlength. HEAD: length more than four-fifths width, 1.19: 1.30; interocular width, 0.75; anterior outline a full semicircle, clypeus as long as juga, strongly narrowed apically; surface shining, impunctate; jugum with two submarginal setigerous punctures, one immediate anterior to eye and one at apical third; ocelli moderate, separated from eye by space equal to twice transverse ocellar

width; jugum ventrally and maxillary plate, except basal margin, polished, impunctate; antennals, I, 0.23: II, 0.26: III, 0.33: IV, 0.38: V, 0.50; bucculae about half as high as labial II; labium reaching between middle coxae, segments, I, 0.46: II, 0.72: III, 0.63: IV, 0.34. PRONOTUM: length more than half width, 1.42: 2.60; anterior margin shallowly emarginate; lateral margin curved from near base, with five setigerous punctures submarginally; transverse impression post median, impressed for full width, marked by row of punctures; anterior lobe impunctate except for not more than five punctures laterally; posterior lobe with twelve to fifteen punctures medially. SCUTELLUM: length less than width, 1.49-1.62; disc shining, with not more than five large punctures. HEMELYTRON: clavus and corium shining; clavus with several punctures in one longitudinal row; mesocorium finely or obsoletely punctate except for one complete and basal third of second row paralleling claval suture; exocorium obsoletely punctured; costa with two setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: faintly alutaceous, punctate only in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate. METAPLEURON: lateral margin of evaporatorium straight; lateral area impunctate. LEGS: not specifically modified, hind tibia with four spines on postero-ventral margin. STERNITES: polished, impunctate. TERMINALIA: genital capsule with few scattered, fine punctures; apical margin very broadly and very shallowly U-shaped; gonostylus as illustrated (Fig. 225). LENGTH of body, 5.00.

TYPE DATA: HOLOTYPE male, "Venezuela Exp., Culebra N. Duida Terr., Amazonas, April 7-16, J. Maldonado Capriles Coll.," in collection of J. Maldonado Capriles.

DISTRIBUTION: The only specimen seen, the type, was from Amazonas Territory in southern Venezuela.

DISCUSSION: The name bisetosus is given in obvious reference to the two setigerous punctures on each jugum.

Pangaeus (Pangaeus) docilis (Walker)

1867 Aethus docilis Walker, Catal. Hemip. Brit. Mus., 1:154.

1882 Pangoeus [?] Dallasi Signoret, Ann. Soc. Ent. France, (6) 2:263, pl. 9, fig. 121.

1893 Pangaeus Dallasi Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1899 Pangaeus docilis Distant, Ann. Mag. Nat. Hist., (7) 4:221.

DIAGNOSIS: The male of docilis may be separated from all other species in the genus by the subbasal angulation on the postero-ventral margin of the hind tibia and the single setigerous puncture on the costa.

DESCRIPTION: MALE:- oval, widest near midlength. HEAD: length two-thirds width, 0.86 (0.81-0.90): 1.28 (1.13-1.36); interocular width, 0.78 (0.72-0.83); anterior outline semicircular, clypeus as long as juga and strongly narrowed apically; surface shining, impunctate, with weak rugae; jugum with one submarginal setigerous puncture anterior to eye; ocelli moderate, separated from eye by space more than twice transverse ocellar width; jugum ventrally and maxillary plate, except basal margin, polished, impunctate; antennals, I, 0.24 (0.21-0.26): II, 0.24 (0.20-0.26): III, 0.36 (0.30-0.43): IV, 0.46 (0.37-0.53): V, 0.55 (0.48-0.60); bucculae nearly as high as labial II; labium reaching between middle coxae, segments, I, 0.44 (0.40-0.46): II, 0.74 (0.66-0.80): III, 0.58 (0.53-0.65): IV, 0.35 (0.30-0.40). PRONOTUM: length little more than half width, 1.47 (1.19-1.69):

2.71 (2.26-2.93); anterior margin shallowly, doubly emarginate; lateral margin straight on basal half, with five setigerous punctures submarginally; transverse impression slightly postmedian, sharply impressed across full width, marked by medially interrupted regular row of close-set punctures; anterior lobe impunctate except for few scattered punctures laterally; posterior lobe impunctate except for few punctures medially. SCUTELLUM: length equal to width, 1.60 (1.36-1.75): 1.60 (1.36-1.75); disc shining, with few to numerous scattered punctures. HEMELYTRON: clavus and corium alutaceous; clavus with one row of punctures; corium not distinctly punctate except along one complete and usually basal part of second row paralleling claval suture; costa with one setigerous puncture; membranal suture straight, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: shining, punctate in depression and anterior to acetabulum; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area with few small punctures. METAPLEURON: lateral margin of evaporatorium concave; lateral area impunctate. LEGS: posterior tibia with subbasal angulation and two subapical spines on postero-ventral margin (Fig. 156). STERNITES: alutaceous, impunctate. TERMINALIA: genital capsule finely alutaceous, with few scattered punctures, apical margin faintly sinuate either side of apex; gonostylus as illustrated (Fig. 226). LENGTH of body, 5.13 (4.21-5.56).

FEMALE: not yet properly associated with male.

TYPE DATA: The type of Aethus docilis, now in the British Museum of Natural History, was stated by Walker (loc. cit.) to have come "Rio Janeiro," Brazil. Signoret (loc. cit.) described dallasi from "Bresil, Guyane." The Brazilian specimen is in the Naturhistorisches Museum and

has a red label bearing the word "Type."

DISTRIBUTION: The range of docilis, as determined from specimens studied, extends from Guatemala into South America as far south as southern Brazil.

DISCUSSION: The type specimen of dallasi was available for study. It is a male that shows well the subbasal angulation on the posterior. In describing the species, Signoret indicated that he thought it might be identical with docilis. Other authors, including Distant (loc. cit.) who attempted to place Walker's species, agree that the two are one and the same. In fact, the type bears a label "docilis Walk.," in an unknown script.

The Panamanian specimens from the Chilibrillo Caves bore a notation, "In cave earth."

SPECIMENS STUDIED: 14 males, 18 females. GUATEMALA: Alta Verapaz: Trece Aguas. PANAMA: Bugaba, Cabima, Cano Saddle (Gatun Lake), Chilibrillo Caves; May to October. Canal Zone: Barro Colorado, Mt. Hope, Paraizo, Summit; February, July to September. COLOMBIA: Rio Daguta. VENEZUELA: Mt. Marachuaca; May. BRAZIL: Amazonas, Chapada, Corumba, Macura, west border Matto Grosso, Nova Teutonia, Taperina; May, September, October. ECUADOR: Balzapampa. PERU: Callanga, Dept. Junin, Marcapata; November.

Pangaeus (Pangaeus) impressus NEW SPECIES

DIAGNOSIS: The male of this new species may be recognized within the subgenus by the combination of a distinct subbasal angulation posteroventrally on the hind tibia, two setigerous punctures on the costa and the lack of an emargination on the apex of the genital capsule.

DESCRIPTION: (based on two males, one broken) MALE:- oval, widest behind midlength. HEAD: length two-thirds width, 1.00 (0.93-1.07): 1.56 (1.53-1.60); interocular width, 0.94 (0.92-0.96); anterior outline nearly or quite a full semicircle, clypeus as long as juga, distinctly narrowed apically; surface shining, impunctate; jugum depressed medially, with one submarginal puncture adjacent to eye; ocelli moderate, separated from eye by space almost twice transverse ocellar width; jugum depressed medially, with one submarginal puncture adjacent to eye; ocelli moderate, separated from eye by space almost twice transverse ocellar width; jugum ventrally and maxillary plate, except basally, polished, impunctate; antennals, I, 0.26 (0.26-0.26): II, 0.33 (0.33-0.33): III, 0.45 (0.44-0.46): IV, 0.56 (??-0.56): V, 0.62 (??-0.62); bucculae little more than half as high as labial II; labium reaching between middle coxae, segments (missing from smaller specimen), I, 0.46: II, 0.74: III, 0.73: IV, 0.46. PRONOTUM: length more than half width, 1.84 (1.71-1.97): 3.43 (3.23-3.64); anterior margin shallowly, doubly emarginate; lateral margin straight on basal half, with five setigerous punctures submarginally; transverse impression median, impressed across full width, marked by medially interrupted, regular row of very close-set punctures; lobes impunctate except for few weak punctures laterally on anterior lobe and several distinct ones on middle of posterior lobe. SCUTELLUM: length little less than width, 2.08 (1.95-2.21): 2.15 (2.02-2.28); disc shining, with few to several scattered punctures. HEMELYTRON: clavus and corium alutaceous; clavus with one row of punctures; mesocorium with one complete and basal part of second row of punctures paralleling claval suture, elsewhere impunctate or obsoletely punctate; exocorium without distinct punctures; costa with one setigerous puncture;

membranal suture virtually straight; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: faintly alutaceous, with distinct punctures only in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate. METAPLEURON: lateral margin of evaporatorium straight; lateral area impunctate. LEGS: posterior tibia with distinct, subbasal angulation on postero-ventral margin which also bears only two subapical spines. STERNITES: finely alutaceous, impunctate. TERMINALIA: genital capsule finely alutaceous, punctate laterally; apical margin slightly convex at middle; gonostylus as illustrated (Fig. 227). LENGTH of body, 6.22 (5.84-6.60).

TYPE DATA: HOLOTYPE male, "Above Tepic, Mexico, Mar. 23, W. M. Mann collector," in United States National Museum. PARATYPE: Tejupilco, Mex., Temescaltepec, VI-18-33, H. E. Hinton, R. L. Usinger Collectors, 1m (RLU).

DISTRIBUTION: At present, this species is known only from Mexico.

DISCUSSION: The presence of a deep transverse impression on the pronotum is reflected in the name impressus.

Pangaeus (Pangaeus) laevigatus Signoret

1882 Pangoeus [!] laevigatus Signoret, Ann. Soc. Ent. France, (6) 2:250, pl. 8, fig. 110.

1882 ?Pangoeus [!] Stali Signoret, Ann. Soc. Ent. France, (6) 2:256. NEW SYNONYMY.

1893 Pangaeus laevigatus Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1893 Pangaeus stali Lethierry and Severin, Gen. Catal. Hemip., 1:70.

DIAGNOSIS: As here determined, laevigatus may be recognized in the subgenus by its large size, single setigerous puncture on submargin of head and one on costa and lack of a ventral, subbasal angulation on the posterior tibia.

DESCRIPTION: (based on one male specimen, the type) MALE:- oval, widest behind midlength. HEAD: length about two-thirds width, 1.13: 1.68; interocular width, 1.06; anterior outline semicircular, juga slightly longer than clypeus, narrowly contiguous above its apex; surface shining, with few moderate, radiating rugae and scattered minute punctures; jugum longitudinally impressed medially, with one submarginal setigerous puncture; ocelli small, separated from eye by space more than three times transverse ocellar width; jugum ventrally and maxillary plate (except near base) shining, impunctate; antennals, I, 0.36: II, 0.35: III, 0.54: IV and V missing; bucculae almost as high as labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.60: II, 1.16: III, 0.80: IV, 0.53. PRONOTUM: length more than half width, 2.15: 3.78; anterior margin deeply, singly emarginate; lateral margin straight on basal half or more, with submarginal row of four setigerous punctures; transverse impression postmedian, weak, obsolete medially, marked by medially interrupted row of punctures; anterior lobe laterally with area of minute punctures inclosing few large punctures, elsewhere impunctate; posterior lobe mostly impunctate, with few obsolete punctures medially. SCUTELLUM: length greater than width, 2.37: 2.21; disc shining, with large, scattered punctures. HEMELYTRON: clavus and corium alutaceous; clavus with one row of punctures; corium virtually impunctate except for single row paralleling claval suture; costa with one setigerous puncture; membranal suture straight, lateral angle not produced; membrane longer than basal width, just reaching apex of abdomen. PROPLEURON: shining, weakly alutaceous, with few large punctures in depression; prosternal carinae much less than half as high as labial II. MESOPLEURON: evaporatorium attaining side margin of segment; lateral area irregular. METAPLEURON: lateral margin

of evaporatorium almost straight; lateral area polished, impunctate. LEGS: posterior tibia without subbasal angulation ventrally, with four preapical spines on postero-ventral margin. STERNITES: obsoletely alutaceous, impunctate. TERMINALIA: genital capsule virtually impunctate except in lateral angles; apical margin slightly convex medially; gonostylus as illustrated (Fig. 228). LENGTH of body, 7.66.

FEMALE: as yet not properly associated with male, unless Pangaeus stali Signoret be it; for further comments, see discussion below.

TYPE DATA: Signoret's (loc. cit.) type of laevigatus was from "Ocana" and now is in the collection of the Naturhistorisches Museum in Vienna. His type of stali (loc. cit.) was from "Bresil" and now is also in the collection of the Naturhistorisches Museum in Vienna.

DISTRIBUTION: As only the two above-mentioned types were seen, the two type countries of Colombia and Brazil comprise the known area of range for the species.

DISCUSSION: The types of both laevigatus and stali were available for study. Laevigatus is based on a male which is distinct from the other species as keyed and described above. Stali was described from female which is almost identical with the male except that the ocelli are slightly larger and separated from the eye by a space not quite three times a transverse ocellar width, and that one posterior tibia has four spines on the postero-ventral margin while the other has five. Although the author cannot yet present a key to the females of this section of the genus due to his inability to find reliable characters, he feels almost confident that stali is but the female of laevigatus and therefore must fall as a synonym, the latter having page priority.

SPECIMENS STUDIED: 1 male, 1 female. These respectively were the types of laevigatus and stali and were labelled "Ocana" and "Brasil."

Pangaeus (Pangaeus) moestus (Stal)

1860 Aethus moestus Stal, Svenska Vet.-Ak. Handl., 2(7):13.

1867 Aethus moestus Walker, Catal. Hemip. Brit. Mus., 1:153.

1876 Pangaeus moestus Stal, Svenska Vet.-Ak. Handl., 14(4):19.

1882 Pangoeus [!] maestus [!] Signoret, Ann. Soc. Ent. France, (6) 2:257, pl. 9, fig. 114.

1893 Pangaeus moestus Lethierry and Severin, Gen. Catal. Hemip., 1:70.

DIAGNOSIS: Among those species with one submarginal setigerous puncture anterior to each eye and the posterior tibia of the male unmodified, this species can be delimited by the presence of two setigerous punctures on the costa and the corium being polished.

DESCRIPTION: (based on one male) MALE:- oval, widest behind midlength. HEAD: length two-thirds of width, 0.88: 1.31; interocular width, 0.80; anterior outline a full semicircle, clypeus as long as juga, strongly narrowed apically; surface shining, impunctate, with obsolete, radiating rugae; jugum with single submarginal puncture near eye; ocelli moderate, separated from eye by more than twice transverse ocellar width; jugum ventrally and maxillary plate, except basal margin, polished, impunctate; antennals, I, 0.26: II, 0.26: III, 0.36: IV, 0.41: V, 0.52; bucculae about half as high as labial II; labium attaining base of middle coxae, segments, I, 0.44: II, 0.70: III, 0.56: IV, 0.34. PRONOTUM: length more than half width, 1.56: 2.85; anterior margin shallowly emarginate; lateral margin almost straight on basal half, with five setigerous punctures submarginally; transverse impression submedian, lightly impressed across full width, marked by regular row of punctures;

anterior lobe impunctate except for four or five punctures laterally; posterior lobe with less than ten punctures medially. SCUTELLUM: length less than width, 1.62: 1.72; disc polished, with sparse, scattered punctures. HEMELYTRON: clavus and corium polished; clavus with one row of strong punctures; corium virtually impunctate except for one complete and interrupted second row of mesocorial punctures; costa with two setigerous punctures; membranal suture straight, lateral angle not prolonged; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: shining, distinctly punctate only in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate. METAPLEURON: lateral margin of evaporatorium straight; lateral area impunctate. LEGS: hind tibia without subbasal spine ventrally, postero-ventral margin with four spines. STERNITES: faintly alutaceous, impunctate. TERMINALIA: genital capsule with few punctures laterally, apical margin straight; gonostylus as illustrated (Fig. 229). LENGTH of body, 5.38.

TYPE DATA: Stal's (loc. cit.) type was from "Rio Janeiro," Brazil, and is now in the collection of the Riksmuseum in Stockholm, Sweden.

DISTRIBUTION: The only specimen seen, besides the female type, was a male from Guatemala. Although these two specimens were from such widely separated localities, there is a possibility that the range is actually that extensive.

DISCUSSION: The single specimen assigned here is a male that agrees quite well with the female type except that its transverse pronotal impression is not quite as deeply impressed medially as is that of the type. At present, the author is not fully confident that he can accurately associate males and females of the same species within this section of the

subgenus. But in order to tie down the name moestus, which was described from a female, he has chosen to apply it to a male which is structurally very similar to the type, even though from a widely removed locality. Assumption that the males and females are usually morphologically similar is not just guess but is based on the results of studying many females that bear data labels identical to those found on some males. The females usually are very similar but never show the ventral subbasal angulation on the hind tibia. Thus, a strong landmark of the males is missing from the females and adds to the difficulty of separating the nearly twice as many female specimens. As soon as a means of delimiting the females of each species becomes evident, judgment on the wisdom of the present action may be passed.

SPECIMENS STUDIED: GUATEMALA: Acatenango, May, 1948, H. T. Dalmat Collector, 1m (USNM).

Pangaeus (Pangaeus) neogeus NEW SPECIES

DIAGNOSIS: Among the species of this subgenus with the single setigerous puncture on the submargin of the head and two on the costa, the males of this species may be recognized by the lack of a ventral, subbasal angulation on the posterior tibia and by the distinctly alutaceous corium.

DESCRIPTION: MALE:- oval, widest posterior to midlength. HEAD: length about two-thirds width, 1.06 (0.86-1.26): 1.57 (1.36-1.81); interocular width, 0.94 (0.83-1.08); anterior outline a slightly flattened semicircle, juga slightly surpassing apex of clypeus and nearly or quite contiguous anterior to it; surface very feebly alutaceous, with obsolete minute punctures; jugum with one submarginal setigerous puncture next to eye; ocelli large, separated from eye by space less than twice transverse ocellar width;

jugum ventrally and maxillary plate (except basally) shining, impunctate; antennals, I, 0.28 (0.26-0.33): III, 0.46 (0.40-0.53): IV, 0.52 (0.46-0.63): V, 0.58 (0.53-0.64); bucculae almost as high as labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.53 (0.43-0.64): II, 0.82 (0.70-1.03): III, 0.60 (0.50-0.83): IV, 0.42 (0.33-0.50). PRONOTUM: length more than half width, 1.92 (1.62-2.08): 3.54 (3.00-3.96); anterior margin moderately, singly emarginate; lateral margin straight on basal two-thirds, with submarginal row of seven setigerous punctures; transverse impression slightly postmedian, weak, obsolete at middle, marked by medially interrupted row of punctures; anterior lobe with few moderate punctures laterally; posterior lobe with few scattered punctures medially. SCUTELLUM: length usually less than width, 2.15 (1.78-2.50): 2.21 (1.82-2.50); shining, with several to many large, scattered punctures. HEMELYTRON: clavus and corium distinctly alutaceous; clavus with one row of punctures; corium impunctate except for one complete and basal half of second row paralleling claval suture; costa with two setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: shining, few large punctures in depression; prosternal carinae almost half as high as labial II, rounded off posteriorly. MESOPLEURON: lateral area polished, impunctate. METAPLEURON: lateral margin of evaporatorium weakly concave; lateral area impunctate. LEGS: posterior tibia without subbasal angulation ventrally, with four or five spines on postero-ventral margin. STERNITES: finely, minutely alutaceous, impunctate. TERMINALIA: genital capsule alutaceous, with few weak punctures laterally, apical margin straight or slightly concave; gonostylus as illustrated (Fig. 230).

FEMALE: not yet properly associated with male.

TYPE DATA: HOLOTYPE male, "Nova Teutonia, Santa Catarina, Brazil, IV-8-1945, F. Plaumann," in collection of J. C. Lutz. PARATYPES: Same locality and collector as holotype, I-6, 1949, 1m; IX-4, 1950, 1m; X-16, 1950, 2m; XII-5, 1948, 1m (all in collection JCL). Same locality and collector, Jan. 1939, 1m (HMH); same locality and collector, VII-30-35, 1m (RIU). Rio Grande do sul Brazil , Stieglmayr, 8m (Wien). Horqueta, Paraguay, 45 miles E., Paraguay Riv., XI-27, 1933, Alberto Schultze, 1m (JCL).

DISTRIBUTION: The type material listed above came from Brazil and Paraguay.

DISCUSSION: Except in size, this species shows very little variation.

Pangaeus (Pangaeus) piceatus Stal

1862 Pangaeus piceatus Stal, Stett. Ent. Zeit., 23:96.

1867 Aethus piceatus Walker, Catal. Hemip. Brit. Mus., 1:150.

1867 Aethus tenuis Walker, Catal. Hemip. Brit. Mus., 1:151.

1867 Aethus parilis Walker, Catal, Hemip. Brit. Mus., 1:153.

1876 Pangaeus piceatus Stal, Svenska Vet.-Ak., 14(4):16.

1877 Pangaeus piceatus Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:388.

1877 Pangaeus ? tenuis Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:390.

1880 Pangaeus piceatus Distant, Biol. Centr.-Amer., Rhynch., 1:6.

1882 Pangoeus [!] Sallei Signoret, Ann. Soc. Ent. France, (6) 2:262, pl. 9, fig. 119. NEW SYNONYMY

1882 Pangoeus [!] piceatus Signoret, Ann. Soc. Ent. France, (6) 2:262, pl. 9, fig. 120.

1882 Pangoeus [!] Petersi Signoret, Ann. Soc. Ent. France, (6) 2:264, pl. 9, fig. 264. NEW SYNONYMY

1882 Pangoeus [!] minimus Signoret, Ann. Soc. Ent. France, (6) 2:265, pl. 9, fig. 123. NEW SYNONYMY

1886 Pangaeus piceatus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Pangaeus minimus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Pangaeus sallei Uhler, Checklist Hemip. N. Am., p. 3.

1893 Pangaeus minimus Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus Petersi Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus piceatus Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus piceatus Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus tenuis Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus parilis "incerti loci" Lethierry and Severin, Gen. Catal. Hemip., 1:81.

1899 Pangaeus piceatus Distant, Ann. Mag. Nat. Hist., (7) 4:221.

1910 Pangaeus piceatus Banks, Catal. Nearc. Hemip., p. 101.

1917 Piceatus piceatus Van Duzee, Univ. California Pubs. Ent., 2:21.

1932 Pangaeus piceatus Barber and Bruner, Jour. Dept. Agr. Puerto Rico,16:237.

1939 Pangaeus piceatus Torre Bueno, Ent. Amer., 19:180.

DIAGNOSIS: Among the species with one setigerous puncture on the submargin of the head and one on the costa, the males of this one may be recognized by the lack of ventral, subbasal angulation on the hind tibia coupled with the presence of but four spines on the postero-ventral margin of the posterior tibia.

DESCRIPTION: oval, broadest slightly posterior to midlength. HEAD:

length more than two-thirds width, 0.86 (0.74-1.00); 1.22 (1.06-1.36); interocular width, 0.75 (0.66-0.84); anterior outline an elongate semicircle, juga little longer than clypeus and almost contiguous anterior to it; surface shining, usually with weak, radiating rugae; jugum with one setigerous puncture submarginally anterior to eye; ocelli moderate, removed from eye by space almost twice transverse ocellar width; jugum ventrally and maxillary plate (except basally) shining, impunctate; antennals, I, 0.25 (0.23-0.29); II, 0.21 (0.21-0.23); III, 0.32 (0.30-0.37); IV, 0.37 (0.36-0.40); V, 0.47 (0.46-0.52); bucculae about half as high as labial II, evanescent posteriorly; labium extended between middle coxae, segments, I, 0.36 (0.35-0.43); II, 0.61 (0.51-0.66); III, 0.50 (0.44-0.56); IV, 0.37 (0.32-0.40). PRONOTUM: length more than half width, 1.40 (1.19-1.56); 2.57 (2.13-2.92); anterior margin shallowly, doubly emarginate; lateral margin straight to weakly convex on basal two-thirds, with submarginal row of four or five setigerous punctures; transverse impression distinct across full width, weaker at middle, marked by medially interrupted row of punctures; anterior lobe impunctate except for few small punctures laterally, median line impressed from subapical line to between calli; posterior lobe with few scattered punctures on anterior half of middle area. SCUTELLUM: length equal to or less than width, 1.46 (1.24-1.64); 1.48 (1.25-1.71); disc shining, with several widely scattered punctures. HEMELYTRON: clavus and corium polished; clavus with one row of punctures; corium obsoletely or not punctate except for punctures in one complete row and usually one partial row paralleling claval suture; costa with one setigerous puncture; membranal suture straight, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: shining, impunctate or with few coarse

punctures in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium reaching lateral margin; lateral area shining, obtusely rugose. METAPLEURON: lateral margin of evaporatorium feebly concave; lateral area shining, impunctate. LEGS: posterior tibia without subbasal angulation ventrally, with four spines on postero-ventral margin. STERNITES; very finely alutaceous, impunctate. TERMINALIA: genital capsule with scattered fine punctures more abundant in lateral impressed areas, apical margin straight or slightly convex medially, edge thickened laterally; gonostylus as illustrated (Fig. 231). LENGTH of body, 4.79 (4.22-5.21).

TYPE DATA: Stal (loc. cit.) originally described piceatus from Mexico. The type specimen is now in the Riksmuseum in Stockholm. Walker (loc. cit.) described his two new species, parilis and tenuis from "Amazon Region" and "Orizaba," Mexico; the types are in the collection of the British Museum of Natural History. Signoret's (loc. cit.) described and named three nominal forms, Sallei from "Laguayra Venesuela et Mexique;" Petersi from "Perou;" and minimus from "Mexique." Two specimens labelled as types of sallei and minimus respectively are in the Naturhistorisches Museum in Vienna, Austria; the type of petersi has not yet been located.

DISTRIBUTION: Based only on the males at hand, the range of this species may be outlined as extending from Mexico south to Peru and northern Brazil and east to Puerto Rico.

DISCUSSION: Until the author is able to properly delimit both sexes of this section of the subgenus Pangaeus he accepts Distant's (1899:221) disposal of Walker's (loc. cit.) two species, parilis and tenuis, as synonyms of piceatus.

The three Signoret species here assigned to synonymy for the first time were so treated for the following reasons. P. minimus, as determined by a personal study of the type, was based on a pale, teneral specimen of piceatus, the light color having prompted Signoret to remark that the pale color contrasted this species with all others in the genus. The situation involving sallei is more complex. Signoret gave Venezuela and Mexico as tye type localities for this species. The specimen bearing the Mexican locality label now bears the type label and was kindly lent for study by Dr. Max Beier of the Naturhistorisches Museum in Vienna. It disagrees with the original descriptions in several important respects: 1) it was said to be similar to piceatus but described and figured as having four submarginal setigerous punctures on each jugum and two to five on the costa--the type has but one on each part; 2) only five, instead of the described nine or ten submarginal setigerous punctures laterally on the pronotum; and 3) the original description stated that the mesopleural evaporatorium was "separee de la suture par un espace lisse atteignant les deux tiers pres des hanches," while in the type this structure extends along the suture and reaches the lateral margin of the segment. These three features as described suggest that sallei is a member of the northern subgenus Boreopangaeus. Perhaps the description was drawn from the Venezuelan specimen and not the Mexican one which now bears the type label. If this is true, the problem is still not solved. The author is not aware that any member of that subgenus occurs on continental South America and so cannot guess which, if any, of the known species of Boreopangaeus it might be. So, until the Venezuelan specimen is examined, the author accepts the Mexican individual as the type and places the name where the specimen obviously belongs, as a synonym of

piceatus. Lastly, petersi also presents certain problems. As yet, the type has not been located so work must be done in reference to the original description and illustration. Of all the specimens which were small enough to be considered as meeting the "4 mill." size stated for this species, some were dallasi, as delimited by the ventral subbasal angulation on the posterior tibia, and the remainder were piceatus. These included several specimens from the type locality of Peru. None of them showed the two submarginal setigerous punctures on the submargin of the jugum as described and illustrated by Signoret. But the present author has developed such a distrust for Signoret's "Revision" that he does not have much faith in either its text or its illustrations. If the text and figures are accurate concerning this species, then it is the only one in the genus lacking the lateral primary setigerous puncture immediately anterior to the eye. Since the presence of the three primary setigerous punctures is characteristic for all the known species of the genus and because Signoret's work has been found to be far from accurate in a number of other instances, the present author prefers to believe that Signoret failed to correctly interpret this part of the animal. Until a specimen is found which agrees with Signoret's works and disproves this belief, the author will cling to it and assign petersi to synonymy under piceatus.

Two of the Costa Rican specimens bore labels indicating they had been collected from cultivated plants, one from strawberry and the other from beans.

SPECIMENS STUDIED: 20 males: MEXICO: Oaxaca: Tuxtepec; July. GUATEMALA: Antigua; August. COSTA RICA: Rio Virillo, San Jose, San Pedro,

Turrialba; January, June to August. PUERTO RICO: Ponce. COLOMBIA: Cali. BRAZIL: Para. PERU: Pachitea.

Pangaeus (Pangaeus) punctinotum NEW SPECIES

DIAGNOSIS: (based on a lone male) MALE:- oval, widest slightly behind midlength. HEAD: length more than two-thirds of width, 0.93: 1.31; interocular width, 0.82; anterior outline almost semicircular, juga longer than and contiguous beyond clypeus; surface impunctate, flattened, juga depressed medially and submarginally with two close-set setigerous punctures in front of eye and two more widely separated ones beyond; ocelli moderate, separated from eye by space almost three times transverse ocellar width; jugum ventrally and maxillary plate, except posteriorly, polished, impunctate; antennals, I, 0.23: II, 0.23: III, 0.33: IV, 0.43: V, 0.60; bucculae almost as high as labial II, evanescent posteriorly; labium reaching bases of middle coxae, segments, I, 0.58: II, 0.73: III, 0.50: IV, 0.33. PRONOTUM: length more than half of width, 1.42: 2.65; anterior margin moderately, singly emarginate; lateral margin feebly sinuate opposite ends of transverse impression, with six submarginal setigerous punctures; anterior lobe with numerous distinct punctures bordering the subapical impression, along midline and in depressed lateral area, collum and calli with minute punctures; transverse impression strongly impressed across full width, marked by row of very close-set punctures; posterior lobe with numerous strong punctures scattered across anterior half. SCUTELLUM: length slightly less than width, 1.55: 1.62; disc polished, with scattered punctures. HEMELYTRON: clavus and corium shining; clavus with incomplete row of punctures; mesocorium with one complete and one incomplete row of punctures paralleling claval suture,

distinctly punctured basally and apically and obsoletely so discally; exocorium obsoletely punctured except at extreme base and apex; costa slightly reflexed, with two setigerous punctures; membranal suture straight, lateral angle somewhat prolonged; membrane little linger than basal width, reaching apex of abdomen. PROPLEURON: faintly alutaceous, distinctly punctate only in depression; prosternal carinae about half as high as labial II. MESOPLEURON: evaporatorium reaching into postero-lateral angle of segment, but not quite attaining lateral margin; lateral area with few punctures. METAPLEURON: lateral margin of evaporatorium straight; lateral area impunctate. LEGS: not specially modified. STERNITES: polished, impunctate. TERMINALIA: genital capsule distinctly punctate only in lateral angles, apical margin straight, entire; gonostylus as illustrated (Fig. 232). LENGTH of body, 5.28.

TYPE DATA: Known only from the HOLOTYPE male, "Mazaruni: High Forest, 20, viii, 1937, British Guiana: coll. Richardson & Smart. B. M. 1937-776," in the British Museum of Natural History, London.

DISTRIBUTION: The lone specimen was from British Guiana.

DISCUSSION: The unusual punctation of the pronotum is unique within the genus and suggested the trivial name. Additional comments on this species may be found in the discussion of rugonotum which is also described as new in this paper.

Pangaeus (Pangaeus) quadrisetosus NEW SPECIES

DIAGNOSIS: The presence of four setigerous punctures on the submargin of the head coupled with the very few scattered punctures laterally on the anterior lobe of the pronotum and the single setigerous puncture on the

costa mark this species as distinct from all others in the subgenus.

DESCRIPTION: (based on one male) MALE:- oval, slightly elongate. HEAD: length more than two-thirds of width, 0.90: 1.34; interocular width, 0.83; anterior outline a full semicircle, clypeus as long as juga and strongly narrowed apically; surface polished, impunctate, with weak radiating rugae; jugum with three or four submarginal setigerous punctures; ocelli small, separated from eye by space more than twice transverse ocellar width; jugum ventrally and maxillary plate, except posterior margin, polished, impunctate; antennals, I, 0.26: II, 0.26: III, 0.36: IV, 0.43: V, 0.51; bucculae about as high as labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.46: II, 0.70: III, 0.60: IV, 0.36. PRONOTUM: length more than half width, 1.49: 2.69; anterior margin moderately, doubly emarginate; lateral margin narrowing from near base, not sinuate, with six setigerous punctures submarginally; transverse impression post-median, moderately impressed for full width, marked by medially interrupted, regular row of coarse punctures; anterior lobe without strong punctures except for less than six laterally; posterior lobe with very few punctures clustered at middle. SCUTELLUM: length and width subequal, 1.66: 1.69; disc polished, with several scattered punctures except at base and apex. HEMELYTRON: clavus and corium finely alutaceous; clavus with single row of punctures; corium impunctate except for one complete and one interrupted row of distinct punctures paralleling claval suture; costa with one setigerous puncture; membranal suture straight, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: weakly alutaceous, punctured in depression and anterior to acetabulum; prosternal carinae less than half as high as labial II. MESOPLEURON:

lateral area impunctate. METAPLEURON: lateral margin of evaporatorium slightly concave; lateral area impunctate. LEGS: posterior tibia with distinct subbasal angulation and one subapical spine on postero-ventral margin. STERNITES: faintly alutaceous, impunctate. TERMINALIA: genital capsule weakly alutaceous, with few scattered punctures, apical margin nearly straight; gonostylus as illustrated (Fig. 233). LENGTH of body, 5.25.

TYPE DATA: HOLOTYPE male, "Horqueta, Paraguay, 57-10, W, 23-24, N, 44 Kilm. East Paraguay Riv., V-27-1935, Alberto Schultze," in collection of John C. Lutz, Philadelphia, Pennsylvania.

DISTRIBUTION: The lone specimen studied, the holotype, was from central Paraguay.

DISCUSSION: As indicated by the placement of this form in the key, it appears to be closely allied to rufobrunneus Jensen-Haarup. Additional specimens might show that it is the male of that species. Unfortunately, specimens of the group characterized by the several submarginal setigerous punctures on each jugum are few in number, and the four species falling in that group were represented by only five specimens among the material studied.

Pangaeus (Pangaeus) quinquespinosus NEW SPECIES

DIAGNOSIS: The male of this species can be recognized from the others with a single submarginal setigerous puncture anterior to each eye and polished coria by the simple posterior tibiae which have five preapical spines.

DESCRIPTION: MALE:- oval, sides subparallel. HEAD: length more than two-thirds width, 0.89 (0.87-0.91): 1.36 (1.30-1.41); interocular width, 0.78 (0.73-0.83); anterior outline semicircular, weakly angulated medially,

juga longer than and narrowly contiguous beyond clypeus; surface polished, impunctate, with mostly obsolete, radiating rugae; ocelli moderate, separated from eye by space almost twice transverse ocellar width; jugum ventrally and maxillary plate, except basally, shining, impunctate; antennals, I, 0.25 (0.24-0.26): II, 0.24 (0.23-0.26): III, 0.33 (0.32-0.36): IV, 0.43 (0.40-0.50): V, 0.55 (0.51-0.58); bucculae almost as high as labial II; labium reaching between middle coxae, segments, I, 0.42 (0.40-0.46): II, 0.68 (0.66-0.73): III, 0.52 (0.47-0.56): IV, 0.35 (0.34-0.40). PRONOTUM: length more than half width, 1.47 (1.34-1.56): 2.73 (2.47-2.86); anterior margin shallowly, doubly emarginate; lateral margin straight on basal half, with five setigerous punctures submarginally; transverse impression weak to obsolete medially, distinctly impressed laterally, marked by medially interrupted, regular row of close-set punctures merging laterally with few scattered punctures on both lobes; posterior lobe with less than a dozen punctures medially. SCUTELLUM: length subequal to or shorter than width, 1.60 (1.42-1.69): 1.61 (1.43-1.75); disc shining, with numerous punctures except at base and apex. HEMELYTRON: clavus and corium polished; clavus with single row of punctures; mesocorium with two complete rows of coarse punctures paralleling claval suture, discally with fine punctures becoming denser towards base and apex; exocorium finely and more densely punctate than mesocorium; costa with one setigerous puncture; membranal suture weakly bisinuate; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: feebly alutaceous, punctate in depression and anterior to acetabulum; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate, weakly rugose. METAPLEURON: lateral margin of evaporatorium distinctly concave; lateral area

impunctate. LEGS: legs not specially modified, postero-ventral margin with five preapical spines. STERNITE: shining, impunctate. TERMINALIA: genital capsule shining, with few punctures laterally; gonostylus as illustrated (Fig. 234). LENGTH of body, 5.23 (4.80-5.70).

TYPE DATA: HOLOTYPE male, "Barro Colo. Id., C. Z. VII-VIII-42, Jas. Zetek, No. 4985," in the collection of the United States National Museum. PARATYPES: same data as holotype, 1m (RCF); same locality and collector, Jan-Apr., 3m (USNM).

DISTRIBUTION: All specimens studied came from Barro Colorado Island in the Canal Zone of Panama.

DISCUSSION: The only habit note attached to any specimen was the conventional "at light."

Pangaeus (Pangaeus) rufobrunneus Jensen-Haarup

1926 Pangaeus rufobrunneus Jensen-Haarup, Ent. Meddel., 16:49.

DIAGNOSIS: The combination of the four or five submarginal setigerous punctures on the jugum, the virtual absence of distinct punctures laterally on the anterior lobe of the pronotum and the presence of three or four setigerous punctures on costa sets this species apart from all others in the subgenus.

DESCRIPTION: (from one specimen, the type female) FEMALE:- oval, broadest behind midlength. HEAD: length slightly more than two-thirds of width, 1.10: 1.60; interocular width, 0.99; anterior outline semicircular, clypeus as long as juga, very slightly narrowed at apex; line on either side of clypeus extending posteriorly to between ocelli where they diverge around a median fovea; surface with numerous minute punctures on coarse,

radiating rugae; jugum with submarginal row of four close-set punctures in front of eye and one separated distally; ocelli small, separated from eye by space about three times transverse ocellar width; jugum ventrally and maxillary plate (except at posterior margin) polished, impunctate; antennals, I, 0.31: II, 0.37: III, 0.39: IV, 0.46: V, 0.54; bucculae about as high as labial II; labium attaining base of middle coxae, segments, I, 0.53: II, 0.80: III, 0.72: IV, 0.43. PRONOTUM: length more than half of width, 1.82: 3.31; anterior margin deeply, simply emarginate; lateral margins not sinuate, with submarginal row of eight or nine setigerous punctures; transverse impression post-median, weakly impressed and obsolete at middle, marked by medially interrupted row of numerous close-set, moderate punctures; surface with numerous scattered, minute punctures; anterior lobe with few, obsolete, small punctures laterally; posterior lobe without coarser punctures. SCUTELLUM: little longer than wide, 2.08: 2.02; disc shining, with very many well-separated minute punctures and numerous widely-separated coarser punctures becoming finer toward apex. HEMELYTRON: clavus and corium weakly alutaceous; clavus with single longitudinal row of punctures; mesocorium obsoletely punctured except for one complete and the suggestion of a second row of distinct punctures paralleling claval suture; exocorium with few obsolete punctures scattered along full length; costa with three or four setigerous punctures; membranal suture almost straight, lateral angle somewhat produced; membrane little longer than basal width, slightly surpassing apex of abdomen. PROPLEURON: alutaceous, without distinct punctures except ventrally in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate, with few oblique rugae. METAPLEURON: lateral margin of evaporatorium distinctly

concave; lateral area alutaceous, neither rugose nor punctate. STERNITES: alutaceous, impunctate. LEGS: posterior tibia without subbasal angulation ventrally, with four spines on postero-ventral margin. LENGTH of body, 6.24.

TYPE DATA: Jensen-Haarup (loc. cit.) listed type material from "Lima" and "Mendoza." The "Lima" specimen is in the Universitetets Zoologiske Museum in Copenhagen, Denmark, and bears a label, "Type., Coll. J-Hrp."

DISTRIBUTION: The type material was from Peru and Argentina. The only specimen examined during the present study was the "Lima" type which was generously loaned by Dr. S. L. Tuxen, of the Universitetets Zoologiske Museum.

DISCUSSION: After the exchange of several letters concerning this and other Jensen-Haarup types gave no satisfactory clue to the identity of the present form, Dr. S. L. Tuxen very kindly sent the specimen on loan. Thus, there is now no doubt as to the identity of this well marked species. Unfortunately, no additional specimens have appeared in the material studied.

The median, interocular fovea around which the proximal ends of the clypeal sutures diverge appears to be unique, not only within this genus, but also within all others in the Western Hemisphere.

SPECIMENS STUDIED: Lima, Galatea, Type, Coll., J-Hrp., Pangaeus rufobrunneus J-Hrp., Jensen-Haarup det.

Pangaeus (Pangaeus) rugonotum NEW SPECIES

DIAGNOSIS: The numerous longitudinal rugae on the posterior third of the calli (Fig. 73) identify this form within the genus.

DESCRIPTION: (based on two females) FEMALE:- oval, widest behind

midlength. HEAD: length more than two-thirds width, 1.05: 1.45; interocular width, 0.95; anterior outline semicircular, clypeus as long as juga, strongly narrowed apically; surface shining, impunctate; juga depressed medially, with four submarginal punctures, two close-set in front of eye and two more widely set distally; ocelli moderate, separated from eye by space about three times transverse ocellar width; jugum ventrally and maxillary plate, except posterior margin, polished, impunctate; antennals, I, 0.31 (0.30-0.32): II, 0.24 (0.23-0.26): III, 0.41 (0.40-0.42): IV, 0.47 (0.46-0.49): V, 0.54 (0.52-0.56); bucculae about half as high as labial II, labium reaching between or just beyond middle coxae, segments, I, 0.53 (0.50-0.56): II, 0.76 (0.76-0.77): III, 0.47 (0.46-0.48): IV, 0.43 (0.43-0.44). PRONOTUM: length more than half width, 1.46 (1.43-1.49): 3.07 (2.95-3.20); anterior margin deeply, doubly emarginate; lateral margin entire, curved from near base; transverse impression submedian, depressed across full width, marked by row of small, close-set punctures; anterior lobe distinctly punctate laterally, discally obsoletely rugulose, posterior third of calli with numerous close-set, longitudinal rugae extending into transverse impression; posterior lobe with few widely separated small punctures, especially medially. SCUTELLUM: length little less than width, 1.75: 1.96; disc polished, with few, widely scattered punctures. HEMELYTRON: clavus and corium shining; clavus impunctate or with incomplete row of obsolete punctures; mesocorium with few punctures in impressed line paralleling claval suture and sometimes basal half of second such lines, elsewhere feebly or not punctured; exocorium impunctate; costa slightly reflexed, with one setigerous puncture; membranal suture straight, lateral margin very feebly or not produced; membrane longer than basal width, slightly surpassing apex of

abdomen. PROPLEURON: faintly alutaceous, with few punctures in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium reaching into postero-lateral angle but not quite reaching lateral margin of segment; lateral area impunctate. METAPLEURON: lateral margin of evaporatorium straight; lateral area impunctate. LEGS: not specially modified, with five spines on postero-ventral margin. STERNITES: polished impunctate. LENGTH of body, 5.82 (5.67-5.97).

TYPE DATA: HOLOTYPE female, "Corumba, Matt. Grosso Brazil, H. G. Barber Collection," in collection of the United States National Museum. PARATYPE: Vilcanota, Peru, H. G. Barber Collection, 1f (USNM).

DISTRIBUTION: The localities listed above are in west central Brazil and southern Peru respectively.

DISCUSSION: The impunctate head with four submarginal setigerous punctures on each side, the reduced punctation of the scutellum and coria and the failure of the mesopleural evaporatorium to reach all the way to the lateral margin of the segment suggests that this species is very close to the lone male on which the new species punctinotum is based, and perhaps may even be the female of that species. However, the pronotal punctation and sculpturing of the two forms plus the presence of but a single costal setigerous puncture in rugonotum is of sufficient worth to separate the two forms until biological evidence is available to indicate their sameness.

Pangaeus (Pangaeus) serripes (Westwood) (Fig. 14)

1837 Cydnus serripes Westwood, Catal. Hemip. Coll. Hope, p. 19.

1851 Aethus margo Dallas, List Hemip. Brit. Mus., 1:116. NEW SYNONYMY

1862 Pangaeus margo Stal, Stett. Ent. Zeit., 23:95.

1867 Aethus margo Walker, Catal. Hemip. Brit. Mus., 1:151.

1868 Aethus scitus Walker, Catal. Hemip. Brit. Mus., 3:535.

1876 Pangaeus margo Stal, Svenska Vet.-Ak. Handl., 14(4):19.

1876 Cydnus serripes "loc. incert." Stal, Svenska Vet.-Ak. Handl., 14(4):26.

1877 Pangaeus margo Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:387.

1880 Pangaeus margo Distant, Biol. Centr.-Amer., Rhych., 1:5, tab. 2, fig. 15.

1881 Pangoeus [!] confusus Signoret, Ann. Mus. Civ. St. Nat. Genova, 16:642.

1882 Pangoeus [!] serripes Signoret, Ann. Soc. Ent. France, (6) 2:247, pl. 8, fig. 106.

1882 Pangoeus [!] margo Signoret, Ann. Soc. Ent. France, (6) 2:248, pl. 8, fig. 108 (not 107 as stated in text.)

1882 Pangoeus [!] confusus Signoret, Ann. Soc. Ent. France, (6) 2:249, pl. 8, fig. 107 (not 108 as stated in text.)

1882 Pangoeus [!] Buchanani Signoret, Ann. Soc. Ent. France, (6) 2:260, pl. 9, fig. 118. NEW SYNONYMY

1886 Pangaeus serripes Uhler, Checklist Hemip. N. Am., p. 3.

1886 Pangaeus confusus Uhler, Checklist Hemip. N. Am., p. 3.

1886 Aethus ? scitus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Pangaeus Buchanani Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1893 Pangaeus margo Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Pangaeus serripes Lethierry and Severin, Gen. Catal. Hemip., 1:70.

1893 Aethus scitus "incerti loci" Lethierry and Severin, Gen. Catal. Hemip., 1:81.

1910 Pangaeus margo Banks, Catal. Nearc. Hemip., p. 100.

1917 Pangaeus margo Van Duzee, Univ. California Pubs. Ent., 2:20.

1939 Pangaeus margo Torre Bueno, Ent. Amer., 19:180.

DIAGNOSIS: The male is easily recognized within the genus by the deep medio-apical emargination of the genital capsule (Fig. 177); the female is not so positively identified, even within the subgenus, except that the large ocelli, which are separated from an eye by less than the transverse diameter of an ocellus (Fig. 46), appear to be serviceable for that purpose within the subgenus.

DESCRIPTION: MALE:- oval, widest near midlength. HEAD: length about two-thirds width, 1.39 (1.15-1.56): 2.14 (1.84-2.36); interocular width, 1.15 (0.98-1.30); anterior outline a slightly elongate semicircle, juga as long as or longer than clypeus and nearly or quite contiguous beyond its apex; surface polished, with few scattered minute punctures, apex distinctly recurved; juga longitudinally impressed medially, with one submarginal setigerous puncture immediately anterior to eye; ocelli large, separated from eye by space less than transverse ocellar width (Fig. 46); jugum ventrally and maxillary plate, except posterior fourth, polished, impunctate; antennals, I, 0.39 (0.33-0.43): II, 0.41 (0.33-0.46): III, 0.57 (0.47-0.63): IV, 0.69 (0.56-0.76): V, 0.78 (0.66-0.83); bucculae (Fig. 24) almost as high as labial II; labium reaching between or slightly beyond middle coxae, segments, I, 0.70 (0.58-0.83): II, 1.19 (0.93-1.30): III, 0.97 (0.80-1.06): IV, 0.56 (0.50-0.62). PRONOTUM: length more than half width, 2.47 (2.15-2.86): 4.55 (3.84-5.04); anterior margin shallowly, doubly emarginate; lateral margin nearly straight on basal two-thirds, with four or five setigerous punctures submarginally; transverse impression weak but evident, marked by medially interrupted row of punctures; anterior lobe with median line finely impressed on apical half, impunctate except for variable lateral patch; posterior lobe with several to many punctures scattered

across full width, most abundant medially. SCUTELLUM: length equal to a slightly longer than width, 2.97 (2.34-3.16): 2.79 (2.34-3.16); disc polished, with numerous punctures scattered nearly to apex. HEMELYTRON: clavus and corium alutaceous; clavus with one complete and sometimes a second incomplete row of punctures; mesocorium with one complete and sometimes another incomplete or complete row of punctures, elsewhere impunctate or with obsolete to distinct punctures, especially basally and at outer apical angle; exocorial punctures likewise varying from absent to distinct; costa with two setigerous punctures; membranal suture straight, lateral angle feebly or not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: weakly alutaceous, punctured in depression and sometimes anterior to acetabulum; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area with few or no punctures. METAPLEURON: lateral margin of evaporatorium weakly or not concave; lateral area impunctate. LEGS: postero-ventral margin of hind tibia with fine angulation at basal sixth (Fig. 155) and three or four subapical spines. STERNITES: without distinct punctures except in spiracular area. TERMINALIA: genital capsule laterally impressed and more distinctly punctate, apical margin slightly elevated either side of broad, deep, U-shaped median emargination (Fig. 177); gonostylus as illustrated (Fig. 235). LENGTH of body, 8.53 (7.34-9.73).

FEMALE:- similar to male but posterior tibia without subbasal angulation and with five or six subapical spines on postero-ventral margin. HEAD: length: width:: 1.28 (1.13-1.56): 1.93 (1.67-2.27); interocular width, 1.10 (1.03-1.24); antennals, I, 0.36 (0.28-0.43): II, 0.36 (0.28-0.43): III, 0.52 (0.50-0.58): IV, 0.62 (0.53-0.76): V, 0.68 (0.63-0.80); labials,

I, 0.64 (0.60-0.80): II, 1.09 (1.00-1.23): III, 0.83 (0.71-0.93): IV, 0.51 (0.46-0.58). PRONOTUM: length: width:: 2.31 (2.02-2.86): 4.29 (3.91-5.06). SCUTELLUM: length: width:: 2.64 (2.40-3.20): 2.60 (2.28-3.20). LENGTH of body, 7.91 (7.01-9.45).

TYPE DATA: The type of Cydnus serripes was described by Westwood (loc. cit.) from "Insula Sti. Vincentii" and is now in the collection of Oxford University, Oxford, England. Dallas' (loc. cit.) type of Aethus margo was reported from "Columbia [?]" and is now in the British Museum of Natural History. Aethus scitus was said by Walker (loc. cit.) to have come from "St. Domingo;" its type is now in the British Museum of Natural History. Since Signoret (1881:642) proposed the name Pangaeus confusus for those Mexican specimens which Stal (loc. cit.) reported as P. margo, these specimens must constitute the type series and are probably now in the Stal collection in the Riksmuseum in Stockholm, Sweden. The last name proposed as new for specimens of the present species was Pangaeus Buchanani which Signoret (loc. cit.) described from "Amazone super;" this type has not yet been located.

DISTRIBUTION: Specimens examined during this study had come from every country from Mexico south to Argentina except British Honduras El Salvador, Costa Rica and Chile, and from the two West Indian islands of Grenada and Trinidad. Collecting in the three Central American countries and the two West Indian islands will undoubtedly yield specimens, while there is serious possibility that the species may not occur in Chile. Only collecting in that country will tell.

DISCUSSION: The wide geographic range and structural variability of serripes has permiteed the forming of many synonyms. This is somewhat

surprising in view of the strong features which clearly define it: 1) strongly emarginate apical margin of the male genital capsule; 2) the subbasal angulation on the postero-ventral margin of the hind tibia; 3) the large ocelli set close to the eyes; and 4) the mesopleural evaporatorium which extends all the way to the lateral margin of the segment. Not one of the descriptions of serripes or its synonyms pointed out one of these characters, although Signoret's illustration of the pleurae did show the extent of the evaporatorium.

The type of Aethus margo Dallas in the British Museum agrees with serripes as defined here so it must fall as a synonym of the latter. Aethus scitus, the type of which is also in the British Museum of Natural History, agrees with serripes and must fall as a synonym of it; Distant (1899:222) had earlier pointed out that scitus was a synonym of margo which is here assigned as a synonym of serripes. The types on which Signoret's two names, Buchanani and confusus, were based have not been located. On the basis of the large size and type locality of Buchanani, and in the absence of contradictory information in the original description, it is being assigned to synonymy here. The original description of confusus Signoret consisted of a series of comparisons pointing out how it differed from margo, a name here recognized as belonging under the common tropical American species serripes. The separating features pointed out by Signoret fall within the range of variation exhibited by serripes so confusus cannot be maintained as a distinct species.

SPECIMENS STUDIED: 37 males, 63 females. MEXICO: Chiapas; Finca Esperanza, La Esperanza; May. Guerrero: Iquala; September. Mexico: Tejupilco; September. San Luis Potosi: Tamazunchale, Valles; May, June.

GUATEMAIA: Finca El Cipres, s. of Flores, Sacapulas; June. PANAMA: Progresso. Canal Zone: Madden Dam. HONDURAS: Ratuch River; June. NICARAGUA: Managa. GRENADA: Balthazar (Windward side), Grand Etang (Leeward side). TRINIDAD: Carriker, nr Port of Spain, St. Augustine; August. FRENCH GUIANA: Cayenne; February. BRITISH GUIANA: source Rio Essequibo. VENEZUEIA: Merida Caracas. COLOMBIA: "W. Colomb.," Bonda, Cali, Muzo, Sta. Marta, Prov. de Sara; May, November. ECUADOR: Balzampa, Bucay; March. BRAZIL: Grajari, Manaos, Matto Grosso, Miriam, Natterer, Para, Pernambuco, Rio de Janeiro, Santa Cruz, Santarem, Sao Paulo, Taperina; July to October. PERU: Chauchamayo, Hera, Ynrimaguas; April, June. PARAGUAY: Horqueta, Sapucay; February, July. BOLIVIA: Prov. Sara, Sta. Cruz de la Sierra; November. ARGENTINA: El Quemado. URUGUAY: Corralitos; January.

Pangaeus (Pangaeus) xanthopus Signoret

1882 Pangoeus [!] xanthopus Signoret, Ann. Soc. Ent. France, 1882:254.

1893 Pangaeus Uhleri xanthopus Lethierry and Severin, Gen. Catal. Hemip. 1:70.

DIAGNOSIS: The bicolored legs, basal third of tibiae (especially posterior pair) distinctly yellowed in contrast to the reddish-brown femora, will set this species apart from all others in the genus.

DESCRIPTION: MALE:- broadly oval, costae mostly arcuate. HEAD: length about two-thirds of width, 1.05 (0.93-1.12): 1.53 (1.36-1.70); interocular width, 0.91 (0.83-1.00); anterior outline a slightly prolonged semicircle, juga as long as or slightly longer than clypeus and greatly narrowing or contiguous beyond it; surface convex, impunctate, with number of weak to distinct radiating rugae; jugum with one submarginal

setigerous puncture anterior to eye; ocelli large, situated on line connecting hind margins of eyes, separated from eye by space less than transverse ocellar width; jugum ventrally and maxillary plate, except basal margin, polished, impunctate; antennals, I, 0.28 (0.26-0.33): II, 0.22 (0.19-0.26): III, 0.38 (0.33-0.43): IV, 0.37 (0.33-0.43): V, 0.40 (0.36-0.46); bucculae not as high as labial II, evanescent posteriorly; labium reaching nearly or quite to bases of middle coxae, segments, I, 0.41 (0.36-0.43): II, 0.59 (0.53-0.64): III, 0.52 (0.50-0.55): IV, 0.41 (0.38-0.46). PRONOTUM: length about half width, 1.62 (1.36-1.90): 3.24 (2.79-3.64); anterior margin shallowly, doubly emarginate; lateral margin entire; very weakly arcuate on basal half, with submarginal row of seven to ten setigerous punctures; transverse impression weak to obsolete, marked by medially interrupted, somewhat irregular row of large punctures; anterior lobe with few scattered punctures behind subapical line, along midline and laterally; posterior lobe with punctation dense medially and becoming sparser laterally. SCUTELLUM: length less than width, 1.97 (1.69-2.21): 2.04 (1.75-2.28); disc weakly alutaceous, with numerous punctures except at base. HEMELYTRON: clavus and corium finely alutaceous; clavus with double row of small punctures; mesocorium with two more or less equally developed rows of distinct punctures paralleling claval suture, rest of area obsoletely punctured except in basal third and in outer apical angle; exocorium with punctures scattered for full length; costa with two to five setigerous punctures; membranal suture nearly straight, lateral angle slightly prolonged; membrane longer than basal width, distinctly surpassing apex of abdomen. PROPLEURON: alutaceous, punctate in depression and anterior to acetabulum; prosternal carinae less than half as high as

labial II. MESOPLEURON: lateral area impunctate. METAPLEURON: lateral margin of evaporatorium weakly concave; lateral area impunctate. LEGS: posterior tibia with spines of postero-ventral margin longer, more slender and tapering than those of dorsal margins (Fig. 159); tibiae bi-colored, basal half or more (especially of posterior pair) pale yellow, contrasting distinctly with the mostly reddish-brown femora. STERNITES: alutaceous, impunctate. TERMINALIA: genital capsule alutaceous, very sparsely, finely punctured medially, apical margin entire, straight in posterior view; gonostylus as illustrated (Fig. 236). LENGTH of body, 5.54 (4.74-6.18).

FEMALE:- very similar to male. HEAD: length: width:: 1.06 (0.95-1.20); 1.51 (1.32-1.74); interocular width, 0.89 (0.81-1.00); antennals, I, 0.28 (0.23-0.33): II, 0.20 (0.16-0.28): III, 0.37 (0.33-0.43): IV, 0.37 (0.33-0.43): V, 0.39 (0.33-0.46); labials, I, 0.41 (0.36-0.48): II, 0.57 (0.40-0.70): III, 0.54 (0.53-0.56): IV, 0.39 (0.36-0.43). PRONOTUM: length: width:: 1.57 (1.30-1.98): 3.12 (2.63-3.70). SCUTELLUM: length: width:: 1.95 (1.69-2.35): 1.97 (1.56-2.40). LENGTH of body, 5.34 (4.41-6.45).

TYPE DATA: Signoret's type specimen (loc. cit.) was reported as having come from "Bresil." The location of this specimen has not been determined, but the original description stated that it was in the collection of the "Musee de Berlin."

DISTRIBUTION: Specimens studied had come from the area from Bolivia and central Brazil south through Paraguay into northern Argentina.

DISCUSSION: Within the subgenus this species and aethiops stand out on the basis of the modification of the spines of the posterior tibiae and

the convex, more or less rugose head surface. Both of these characters appear in the genus Cyrtomenus which these two species resemble quite closely superficially due to their more convex dorsum. Other students may prefer to transfer aethiops and xanthopus to Cyrtomenus, a step which could be easily accomplished by rearranging the key to genera so that the character of the spines of the hind tibiae comes before that of the subapical impression of the pronotum. The present author, however, prefers to consider the subapical impression a better phylogenetic indicator and to leave these two forms as they have been treated for many years. Also to be considered is the fact that all species of Crytomenus exhibit a complete row of submarginal setigerous punctures which are absent here. The conclusion to do this is admittedly conservative and currently tentative until investigation of the internal genitalia of the female confirms or contradicts it.

SPECIMENS STUDIED: BOLIVIA: Prov. Sara, Sta Cruz de la Sierra (450 m.), Tiguipa; April, November, December. BRAZIL: Bahia, Ceara, Ioazeiro, Parnagua, Serrinha Paranha; October to December. PARAGUAY: Horqueta, Villarrica; November to February. ARGENTINA: Patquia, Tucuman; January.

Genus Prolobodes Amyot and Serville

1843 Lobostoma Amyot and Serville, Hist. Nat. Hemip., p. 87 (nec Berthold, 1827:528, in Trematoda; nec Rafinesque, 1831:5, in Coelenterata; nec Gundlach, 1840:356, in Mammalia).

1843 Prolobodes Amyot and Serville, Hist. Nat. Hemip., p. 676.

1890 Discostoma Scudder, Rept. United States Geol. Geogr. Surv. Terr., 13: 452.

DIAGNOSIS: This genus is remarkable among all genera of Cydnidae, except Scaptocoris, by reason of the large, semicircular, foliaceous lobe on the second segment of labial II (Fig. 36). It is easily separated from Scaptocoris by many characters, not the least of which is the fact that the members of Prolobodes have the anterior tarsi inserted at the tip of the tibia (Fig. 122) instead of near middle of tibia as in Scaptocoris (Fig. 115).

DESCRIPTION: size very large (11.5-17.0), dorsum nearly as strongly convex as venter, shape oval, greatest width posterior to midlength. HEAD: length about two-thirds width, oblique, flattened except for tumid interocular area and strongly reflexed juga (Fig. 36); jugal margins entire, with submarginal row of thirteen to sixteen coarse, close-set setigerous punctures bearing long hair-like setae but no blunt, peg-like setae; eyes prominent; ocelli large, situated on or behind line connecting posterior margins of eyes, separated from latter by space not as great as transverse ocellar width; antennae five-segmented, short, not reaching posterior margin of pronotum, II shortest, III, IV and V subequal, longer than I; bucculae almost as high as labial II (without lobe), evanescent posteriorly; labium (Fig. 36) reaching between middle coxae, II longest, strongly curved apically and with large, semicircular, foliaceous lobe, this often hidden between anterior coxae, IV shortest. PRONOTUM: length more than half width; anterior margin moderately, doubly emarginate; lateral margin straight on basal half, with submarginal row of fourteen to nineteen setigerous punctures; transverse impression submedian, impressed or not, marked by row of distinct punctures; anterior lobe subapically with punctate impressed area which is larger in males than females. SCUTELLUM: wider than long; width of broadly rounded apex less than half the length of

membranal suture. HEMELYTRON: corial areas well-defined and, except for limited area on exocorium, more or less uniformly punctate throuthout; membranal suture weakly concave, lateral angle noticeably produced; membrane almost two-fifths hemelytral length, its length greater than basal width, surpassing apex of abdomen. PROPLEURON: finely punctate in depression; prosternal carinae very low, a thick, blunt ridge. MESOPLEURON: (Fig. 110) flat, impunctate, evaporatorium reaching into postero-lateral angle, attaining lateral margin of segment. METAPLEURON: (Fig. 110) flattened to slightly convex, osteolar peritreme reaching half way across segment, without terminal modification, osteole opening posteriorly; evaporatorium occupying mesal two-thirds of segment. LEGS: moderately large; anterior tibia (Fig. 122) not suprassing tarsal insertion, compressed, dorsally with nine to ten stout, blunt spines; posterior tibia strongly compressed, curved, with rows of spines restricted to dorsal and ventral margin; spines of postero-ventral margin much longer and more slender than those of dorsal margin; tarsal I longest, II shortest. STERNITES: polished, with few punctures, especially laterally; each segment laterally with one or two setigerous tubercles submarginally. TERMINALIA: male genital capsule slightly emarginate at middle apex.

One nymph, a third instar, was available for study. It showed the semicircular foliaceous lobe on the labium, the submarginal row of hair-like setae on the head, and the differences in the vestiture of the posterior tibia.

GENOTYPE: of Lobostoma Amyot and Serville (1843:87) (nec Berthold, 1827:528, in Trematoda; nec Rafinesque, 1831:5, in Coelenterata; nec Gundlach, 1840:356, in Mammalia) Cydnus giganteus Burmeister (1835:375)

designated by Kirkaldy (1903:232). Since Prolobodes and Discostoma were proposed to replace the preoccupied Lobosotoma they must both take Cydnus giganteus as type, by objective synonymy.

DISTRIBUTION: From available specimen records this genus appears restricted to tropical America from Nicaragua in the north to southern Brazil and Paraguay in the south.

DISCUSSION: There can be little doubt about the species of this genus being closely allied to those of Cyrtomenus, but the foliaceous, semicircular lobe on labial II sets them apart morphologically and probably also represents a biological difference. Just what might be the significance of such a structure is conjectural. Within it may be seen the coiled, elongate stylets. This would suggest a peculiarity in feeding habits. China (1931) reported that such coiling of the stylets appeared in three other families of the Hemiptera, the Aradidae, Termitaphididae and some Plataspidae. He further pointed out that although these groups were not otherwise closely related they all feed on fungus. Could it be that the members of Prolobodes are also fungus-feeders? Or do they employ these long slender structures in probing for roots and thus avoid the necessity of burrowing to each root from which they feed? Only observations on living animals will conclusively determine the exact use of such a structure.

Key to the Known Species of Prolobodes

1. Anterior pronotal lobe with not more than five or six coarse punctures laterally, usually with none. . . . . gigas (Sign.) p. 272

   Anterior pronotal lobe with fifteen or more coarse, deep punctures laterally 2

2. Pronotum with a weak, transverse impression near midlength, this with numerous crowded, coarse, deep, impressed punctures which often show longitudinal rugae between them (Fig. 11). . . .

I, 0.79 (0.70-1.02): II, 0.54 (0.46-0.63): III, 0.95 (0.83-1.02): IV, 0.97 (0.95-1.01): V, 0.99 (0.90-1.10); labials, I, 1.26 (1.22-1.30): II, 1.85 (1.78-1.91): III, 1.53 (1.45-1.59): IV, 1.07 (1.00-1.13). PRONOTUM: length more than half of width, 5.23 (4.78-5.57): 9.48 (8.83-10.10); transverse impression weak but evident across entire width and with numerous crowded, sunken punctures; anterior lobe with numerous (twenty or more) moderate punctures laterally; posterior lobe on anterior half with numerous punctures sparser and slightly finer than those of transverse impression. SCUTELLUM: wider than long, 6.21 (5.76-6.73): 5.52 (5.12-5.97); disc with numerous, in part contiguous punctures. PRO-, MESO- and METAPLEURA: as described for genus. LEGS and STERNITES: as described for genus. TERMINALIA: gonostylus as illustrated (Fig. 237). LENGTH of body, 15.52 (14.40-15.72).

FEMALE:- rather similar to male, but anterior pronotal impression weaker and less extensive than in male, measurements more variable. HEAD: length: width:: 2.46 (2.21-2.60): 3.63 (3.21-3.94); interocular width, 2.29 (2.02-2.40); antennals, I, 0.66 (0.62-0.70): II, 0.50 (0.40-0.60): III, 0.94 (0.90-0.96): IV, 0.89 (0.83-0.96): V, 0.94 (0.88-1.01); labials, I, 1.23 (1.01-1.33): II, 1.80 (1.63-1.96): III, 1.57 (1.46-1.66): IV, 1.09 (1.01-1.18). PRONOTUM: length: width:: 4.99 (4.35-5.46): 9.35 (7.64-10.05). SCUTELLUM: width: length:: 5.88 (4.95-6.45): 5.53 (4.52-6.00). LENGTH of body, 14.64 (12.89-16.18).

TYPE DATA: As yet, the author has not located the types which Burmeister (loc. cit.) described "von Para und Siara," Brazil.

DISTRIBUTION: At present, this species is known only from Brazil, Bolivia and Paraguay.

DISCUSSION: Burmeister's choice of a name for this species was accurate because some individuals of it are the largest cydnids in the world, both in length and bulk. In size it is rivalled only by the other species of the genus and a few of the larger species of Cyrtomenus.

SPECIMENS STUDIED: 8 males, 12 females. BRAZIL: Caviuna, Chapada, Corumba, Rio San Francisco, Saltada Cruzes, Salta Grande, Sao Paulo; May, October to December. BOLIVIA: Prov. del Sara; November. PARAGUAY: Horqueta, Villarrica, Trinidad; October to December.

Prolobodes gigas (Signoret)

1881 Lobostoma gigas Signoret, Ann. Soc. Ent. France, (6) 1:195, pl. 6, fig. 15.

1893 Prolobodes gigas Lethierry and Severin, Gen. Catal. Hemip., 1:62.

DIAGNOSIS: The absence of prominent, coarse punctures laterally on the anterior lobe of the pronotum (one specimen showed a few, less than six) marks this species from the other two within the genus.

DESCRIPTION: MALE:- HEAD: length nearly two-thirds of width, 2.49 (2.28-2.63): 3.71 (3.56-3.88); interocular width, 2.17 (2.08-2.22); juga dorsally with radiating rugae weak to obsolete, impunctate or with obsolete minute punctures; antennals, I, 0.75 (0.73-0.80): II, 0.61 (0.54-0.70): III, 0.96 (0.93-1.01): IV, 1.03 (0.98-1.07): V, 1.10 (1.06-1.15); labials, I, 1.31 (1.16-1.38): II, 1.75 (1.72-1.82): III, 1.59 (1.39-1.76): IV, 1.09 (1.06-1.15). PRONOTUM: length more than half of width, 5.07 (4.64-5.47): 8.94 (8.37-9.31); transverse impression absent or weakly indicated laterally, marked by a band of several, usually well separated punctures; anterior lobe not or only very feebly and minutely punctured (one specimen with a few moderate punctures laterally); posterior lobe with a few widely separated

punctures on anterior half. SCUTELLUM: wider than long, 5.72 (5.40-6.27): 5.21 (4.80-5.39); disc with several irregularly but distinctly separated, moderate punctures. PRO-, MESO- and METAPLEURAE: as described for genus. LEGS and STERNITES: as described for genus. TERMINALIA: gonostylus as illustrated (Fig. 238). LENGTH of body, 15.15 (13.94-15.90).

FEMALE:- similar to male but jugal rugae and anteapical pronotal impression weaker, measurements mostly smaller: HEAD: length: width:: 2.25 (2.18-2.31): 3.49 (3.37-3.68); interocular width, 2.09 (2.02-2.18); antennals, I, 0.70 (0.66-0.73): II, 0.55 (0.53-0.58): III, 0.85 (0.84-0.87): IV, 0.93 (0.92-0.96): V, 1.04 (1.01-1.08); labials, I, 1.23 (1.22-1.26): II, 1.72 (1.70-1.74): III, 1.52 (1.40-1.64): IV, 1.06 (1.02-1.10). PRONOTUM: length: width:: 4.20 (3.91-4.48): 7.72 (7.23-8.17). SCUTELLUM: width: length:: 5.07 (4.65-5.31): 4.79 (4.61-5.10). LENGTH of body, 13.26 (12.60-13.68).

TYPE DATA: Signoret (loc. cit.) gave the type locality as "Santa-Fe-de-Bogata." A female in the Naturhistorische Museum in Vienna is labelled "Bogata" and "gigas" and marked with a red type label. The three legs from the right side of the type are glued to a small card on another pin; antennals II-V are missing from both sides, as are all middle and hind tarsi; all bristles have been abraded from head, pronotum and costa.

DISTRIBUTION: Two of the eleven specimens seen were from Colombia, all the others had been collected in Panama and Nicaragua, indicating it to be more common to the north of the type locality.

DISCUSSION: The type female noted above was generously made available for study by Dr. M. Beier of the Naturhistorisches Museum in Vienna.

SPECIMENS STUDIED: 6 males, 5 females. PANAMA: Barro Colorado, Canal Zone, 22-VI, 1924, N. Banks, 1f (MCZ); same locality, Nov., M. Bates Coll, 1m (MCZ); same locality, Dodge labelled Cyrtomenus grossus , 1m (MCZ); same locality, Nov. 25, '93, E. I. Huntington, F.301125, 1m (AMNH). Cocoli, Canal Zone, VIII-21-1946, N. L. H. Krauss, 1m, 1f (USNM). Gatun, Canal Zone, Aug., 1922, 1f (USNM). Lachorrera, 12-V-12, Aug., Busck, 1f (USNM). NICARAGUA: Nr. Bluefields, 31.8.92, W. Richmond, 1f (USNM). COLOMBIA: Don Amo, July, Acc. No. 19992, 2m (Car).

Prolobodes reductum (Amyot and Serville)

1843 Lobostoma reductum Amyot and Serville, Hist. Nat. Hemip., p. 88.

1843 Prolobodes reductus Amyot and Serville, Hist. Nat. Hemip., p. 676.

1876 Lobostoma reducta Stal, Svenska Vet.-Ak. Handl., 14(4):18.

1881 Lobostoma reductum Signoret, Ann. Soc. Ent. France, (6) 1:195, pl. 6, fig. 16.

1893 Prolobodes reductus Lethierry and Severin, Gen. Catal. Hemip., 1:62.

DIAGNOSIS: The presence of numerous punctures laterally on the anterior lobe of the pronotum plus the lack of an impressed transverse impression set this species apart from the other two in the genus.

DESCRIPTION: MALE:- HEAD: length about two-thirds of width, 2.29 (2.21-2.40): 3.42 (3.36-3.58); interocular width, 2.16 (2.15-2.20); juga dorsally with very weak, radiating rugae and usually obsolete minute punctures; antennals, 0.72 (0.63-0.80): II, 0.63 (0.60-0.70): III, 0.86 (0.79-0.90): IV, 1.01 (0.93-1.10): V, 1.05 (1.01-1.09); labials, I, 1.20 (1.13-1.26); II, 1.73 (1.66-1.77): III, 1.50 (1.43-1.59): IV, 1.04 (0.96-1.14). PRONOTUM: length more than half of width, 4.79 (4.49-5.18): 8.15 (750-8.70);

transverse impression absent or very weakly indicated laterally; anterior lobe with fifteen or more punctae laterally; posterior lobe with few widely scattered punctae on anterior half. SCUTELLUM: wider than long, 5.35 (4.95-5.67): 4.98 (4.65-5.25); disc with numerous, irregularly spaced punctures, some tending to coalesce and form transverse rugae between them. PRO-, MESO- and METAPLEURAE: as described for genus. LEGS and STERNITES: as described for genus. TERMINALIA: gonostylus as illustrated (Fig. 239). LENGTH of body, 14.01 (13.27-14.58).

FEMALE:- similar to male but anterior pronotal impression weaker and measurements more variable: HEAD: length: width:: 2.25 (2.08-2.47): 3.34 (3.09-3.74); interocular width, 2.08 (1.95-2.21); antennals, I, 0.71 (0.66-0.78): II, 0.53 (0.51-0.56): III, 0.76 (0.73-0.81): IV, 0.90 (0.80-0.98): V, 0.99 (0.90-1.13); labials, I, 1.15 (1.08-1.30): II, 1.66 (1.62-1.74): III, 1.43 (1.33-1.74): IV, 1.01 (0.98-1.05). PRONOTUM: length: width:: 4.38 (3.60-5.08): 7.60 (6.63-8.67). SCUTELLUM: width: length:: 5.18 (4.50-5.81): 4.88 (4.27-5.42). LENGTH of body, 13.30 (11.62-14.61).

TYPE DATA: The type of this species was said by Amyot and Serville (loc. cit.) to have come from "Cayenne," French Guiana. Its present location is unknown to the author.

DISTRIBUTION: This is a South American species which is known to range from the island of Trinidad and the Guianas south to Paraguay and Brazil.

DISCUSSION: As originally proposed, this name appeared in parentheses in a paragraph following the treatment of giganteus. This apparently explains why several of the early workers overlooked it during their studies.

SPECIMENS STUDIED: 10 males, 9 females. TRINIDAD: St. Benedict Mt., Tunapuna; September. BRITISH GUIANA: Bartica District; June, July. FRENCH GUIANA: Maroni River, St. Jean. BRAZIL: Alagoinhas, Hyutanaban, Santarem, Taperhina. PERU: Achinamiza; December. BOLIVIA: Buena Vista, Ichilo, Santa Cruz, Prov. del Sara; November, December. PARAGUAY: Villarrica.

Genus Cyrtomenus Amyot and Serville

1842 Cyrtomenus Amyot and Serville, Hist. Nat. Hemip., p. 90.

1879 Syllobus Signoret, Bull. Soc. Ent. France, 1879:225.

DIAGNOSIS: The lack of a differentiated terminal lobe at the apex of the osteolar canal, the compressed posterior tibia on which the spines of the postero-ventral margin are longer and distinctly more slender than those on the dorsal margin and the simple second labial segment combine to separate this genus from all others in the Western Hemisphere.

DESCRIPTION: Size large, length of body 6.4-13.3 mm.; shape oval, widest distinctly posterior to midlength; dorsum strongly and venter still more strongly convex. HEAD: nearly or about two-thirds as long as wide, oblique, flattened or convex above, with a distinct, marginal carina; juga equal to or longer than clypeus, converging and sometimes contiguous in front of the latter; margins rounded or sometimes triangularly produced either side of apex (Fig. 58); a submarginal row of seven to twelve coarse punctures, each bearing a single long, tapering hair-like setae; ocelli moderate to large, situated on or slightly behind a line connecting hind margins of eyes, separated from eyes by less than twice the width of ocellus; antennae five-segmented, II usually shortest (equal to II in marginalis), III and IV often subequal, V longer or shorter than IV;

bucculae low to moderately high, reaching nearly to base of head; labium variable in length, reaching to middle coxae or as far as base of abdomen, II compressed but without a semicircular foliaceous lobe above, II and III usually subequal and longer than I or IV. PRONOTUM: length about three-fourths width, narrowed from base; anterior margin moderately and broadly emarginated; lateral margins carinate, arcuate for full length or straight to weakly concave on basal half or more, submarginal row of six to twenty-five coarse, setigerous punctures; posterior margin broadly rounded; transverse impression near midlength, varying from distinct to obsolete, usually marked with a row or band of coarse punctures; male of some species with a broad, shallow, median, subapical impression. SCUTELLUM: width subequal to or shorter than length, triangular, apex narrowed, narrower than half the length of the corio-membranal commissure; disk with widely, irregularly scattered, fine or coarse punctures. HEMELYTRON: polished, more or less punctured throughout; corio-claval suture distinct; clavus usually with single row of coarse, close-set punctures for most of its length; costal margin with no to twenty-two setigerous punctures; membranal suture nearly straight; membrane almost two-fifths of hemelytral length. PROPLEURON: surface polished or closely and finely punctured and/or striated, depression usually punctate; prosternal carinae low, obtuse, area between them sunken. MESOPLEURON: flattened; evaporatorium extensive, reaching posterior and lateral margins of segment, sometimes entire (Fig. 109) and sometimes interrupted by posterior, submarginal polished spur extending mesally from lateral area; posterior margin finely crenulate; mesosternum swollen and partly carinate along midline, with a number of long, fine hairs on apical half. METAPLEURON: (Fig. 109) flat; evaporatorium reaching about two-thirds across segment; osteolar peritreme extended about half way across

evaporatorium, without a differentiated apical structure, osteole opening posteriorly at base of subapical "hook." LEGS: moderately long; anterior tibia (Fig. 123) compressed, not surpassing tarsal insertion, dorsal margin with eight to ten stout, blunt spines; middle tibia stout, somewhat compressed, spines of postero-ventral margin longer and more slender than those of dorsal margin; posterior tibia (Fig. 142) distinctly compressed, spines restricted to dorsal and ventral margins, those of postero-ventral margin longer and more slender than those of dorsal margin; tarsi three-segmented, II shortest. STERNITES: polished, with or without rows of setigerous punctures across segments; segmental sutures entire or finely crenulate.

The only nymphal material available was of the common North American species ciliatus (=mirabilis auct. nec Perty). The several specimens involved possessed the submarginal setae on the head, the longer, finer spines on the postero-ventral margin of the posterior tibia and the simple second labial segment.

GENOTYPE: Cyrtomenus castaneus Amyot and Serville (1843:91), subsequently designated by Kirkaldy (1903:230); of Syllobus, Cyrtomenus emarginatus Stal (1862:95), monobasic. C. castaneus belongs to the common Cyrtomenus of the southern United States and therefore must fall as a synonym of Palisot Beauvois' name ciliatus which antedates it by thirty-eight years.

DISTRIBUTION: This genus is known to occur only in the Western Hemisphere where its included species range from 40° north latitude in the eastern United States south and west through Central America to about 35° south latitude in Argentina in South America.

DISCUSSION: Stal's species Cyrtomenus emarginatus, for which Signoret (1879:225) erected the new genus Syllobus, is here being returned to its original assignment to Cyrtomenus. This is being done because emarginatus shows the same thick-set, convex form, the flattened and somewhat curved posterior tibia with the longer, more slender postero-ventral spines, the short osteolar peritreme with a posterior, subapical hook but no differentiated terminal process and the indicated closer relationship with teter whose placement in Cyrtomenus has been generally accepted. Signoret apparently based his separation of the two genera chiefly on the triangularly produced apices of the juga. While this is admittedly a conspicuous character in a family of superficially morphologically similar forms, it is hardly of sufficient fundamental value to out-weigh the several features which ally emarginatus to Cyrtomenus.

The species included in this genus as thus understood may easily be arranged in two major groups on the basis of the shape of the mesopleural evaporatorium. In one group, which contains emarginatus and the other larger South American species, this evaporatorium is interrupted posteriorly by a submarginal, mesally directed spur from the lateral area which reaches more than half way to medial angle of segment; in the other group the mesopleural evaporatorium is not interrupted (Fig. 109) by such a shining area. If these two groups are recognized as subgenera, as is proposed to be done here, the one with the uninterrupted mesopleural evaporatorium contains the genotype, castaneus, and will take the subgeneric name Cyrtomenus, while the other will take the name Syllobus which had previously been proposed for one of its included species, emarginatus.

Key to the Subgenera of Cyrtomenus

1. Mesopleural evaporatorium posteriorly interrupted by shining, submarginal band. . . . . Syllobus p. 243

Mesopleural evaporatorium entire (Fig. 109). . . . . Cyrtomenus p.

Subgenus Syllobus Signoret

1879 Syllobus Signoret, Ann. Soc. Ent. France, (5) 9:225.

DIAGNOSIS: This subgenus is best identified by the posterior, submarginal interruption of the mesopleural evaporatorium as described in key to subgenera.

DESCRIPTION: Size usually larger, 8.99-13.95, but marginalis measures only 7.07 (known only from type female). Juga rounded and equalling or surpassing clypeus or triangularly produced apically and contiguous in front of it. PRONOTUM: laterally with ten to twenty-five setigerous punctures submarginally; of males with a large, shallow, subapical, somewhat cruciform impression. STERNITES: polished; submarginal or median rows of setigerous punctures on segments I to III, usually with small or moderate setae arising from them. LEGS: posterior tibia not or but gradually and little expanded toward apex.

SUBGENOTYPE: Cyrtomenus emarginatus Stal (1862:95), monobasic.

DISTRIBUTION: The known range extends from Mexico south through the northeastern part of South America to southern Brazil; this being a more or less central part of the range of the entire genus. The Florida record for emarginatus by Torre Bueno (1939) requires confirmation, and at best probably represents only an adventive specimen.

DISCUSSION: Of the four species belonging to this subgenus, two, emarginatus and marginalis, are well marked. Emarginatus is strongly

characterized by the remarkable, triangular projections at the apices of the juga; and marginalis by the much more numerous setae on the sides of the pronotum and costa. The other two, teter and grossus, are very closely allied to each other, but appear distinct on the basis of external features as well as on the shape of the gonostyli.

Key to the Species of the Subgenus Syllobus

1. Costa with twenty or more setigerous punctures . . . . . marginalis Sign. p. 287

   Costa with not more than ten setigerous punctures. 2

2. Apices of juga projecting as blunt to acute triangles (Fig. 58). . . . . emarginatus Stal p. 281

   Apices of juga rounded, not projecting triangularly. 3

3. Interocular width distinctly greater than length of head; costa not continuing or paralleling outline of lateral margins of pronotum, distinctly more flaring posteriorly. .grossus Dall. p. 284

   Interocular width less than length of head; costa continuing or paralleling outline of lateral margins of pronotum . . . . . teter (Spin.) p. 289

Cyrtomenus (Syllobus) emarginatus Stal

1862 Cyrtomenus emarginatus Stal, Stett. Ent. Zeit., 1862:95.

1867 Cyrtomenus emarginatus Walker, Catal. Hemip. Brit. Mus., 1:147.

1876 Cyrtomenus emarginatus Stal, Svenska Vet.-Akad. Handl., 14(4):27.

1879 Syllobus emarginatus Signoret, Ann. Soc. Ent. France, (5) 9:clxxiii.

1880 Syllobus emarginatus Distant, Biol. Centr.-Amer., Rhynch., 1:4, tab. 3, fig. 6.

1881 Syllobus emarginatus Signoret, Ann. Soc. Ent. France, (6) 1:322, pl. 10, fig. 40.

1886 Syllobus emarginatus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Syllobus emarginatus Lethierry and Severin, Gen. Catal. Hemip., 1:64.

1939 Syllobus emarginatus Torre Bueno, Ent. Amer., 19:177.

DIAGNOSIS: This species can be recognized, not only within this subgenus but among all the Cydnidae of the Western Hemisphere, by the triangularly projecting jugal apices (Fig. 58).

DESCRIPTION: MALE:- HEAD: length more than half width, 1.79 (1.62-2.47): 2.84 (2.60-3.13); interocular width, 1.57 (1.49-1.62); anterior outline forming one blunt to acute angulation either side of median emargination (Fig. 58); surface polished, jugum with numerous round and elongate punctures; ocelli large, separated from eye by space slightly more than half of transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate with fine punctures and wrinkles; antennals, I, 0.58 (0.50-0.70): II, 0.39 (0.30-0.50): III, 0.79 (0.73-0.86): IV, 0.81 (0.63-1.00): V, 0.95 (0.83-1.00); bucculae not more than half as high as labial II; labium reaching between middle coxae, segments, I, 0.92 (0.83-1.00): II, 1.49 (1.30-1.66): III, 1.39 (1.26-1.66): IV, 1.06 (0.93-1.20). PRONOTUM: length more than half width, 3.80 (3.60-4.20): 6.66 (6.15-7.35); lateral margin straight on basal third or half, with submarginal row of six to nine setigerous punctures; transverse impression obsolete, marked by irregular, interrupted row of punctures; anterior lobe with very broad, shallow, median, subapical depression; this depression and sides of both lobes with coarse and fine punctures intermixed; posterior lobe with few large punctures medially. SCUTELLUM: length little less than width, 4.34

(3.76-4.49): 4.31 (3.90-4.81); impunctate across base and apex, disc with widely scattered, coarse, sunken punctures. HEMELYTRON: clavus and corium polished; clavus with single row of large punctures; mesocorial punctures forming two more or less distinct rows paralleling claval suture, elsewhere with scattered punctures; exocorial punctation more abundant and variable than that of mesocorium; costa with none to three setigerous punctures. PROPLEURON: polished, with numerous fine punctures in depression. MESOPLEURON: evaporatorium interrupted posteriorly by shining submarginal band; lateral area impunctate. METAPLEURON: lateral margin of evaporatorium distinctly concave; lateral area impunctate. LEGS: posterior tibia not expanded near apex. TERMINALIA: genital capsule strongly punctate laterally, apical margin with broad, shallow emargination medially; gonostylus as illustrated (Fig. 240). LENGTH of body, 11.91 (10.80-13.39).

FEMALE:- similar to male, but lacking median, subapical depression on anterior lobe of pronotum and often with pronotal punctation less dense; measurements averaging larger. HEAD: length: width:: 1.84 (1.69-1.95): 3.13 (2.93-3.26); interocular width, 1.71 (1.62-1.82); antennals, I, 0.67 (0.60-0.73): II, 0.49 (0.40-0.53): III, 0.89 (0.76-0.96): IV, 0.93 (0.80-1.00): V, 1.04 (0.96-1.10); labials, I, 1.01 (0.93-1.13): II, 1.60 (1.33-1.72): III, 1.62 (1.43-1.69): IV, 1.11 (1.00-1.23). PRONOTUM: length: width:: 4.02 (3.57-4.29): 6.91 (6.28-7.28). SCUTELLUM: length: width:: 4.28 (3.71-4.71): 4.55 (4.14-4.85). LENGTH of body, 12.96 (11.25-13.95).

TYPE DATA: Although no locality was specifically cited in the original description, the title of the paper in which Stal (loc. cit.) described it indicated that the material had come from Mexico. The type has not been located; it is not in the Stal Collection now housed in

Naturhistoriska Riksmuseum in Stockholm.

DISTRIBUTION: Emarginatus is known to occur from Mexico south to Peru and central Brazil. Torre Bueno's (1939) record for Florida needs verification, and may prove to have been based on an adventive.

DISCUSSION: In citing this species as the sole inclusion in his new genus Syllobus, Signoret (1879) gave the original combination of this name as "Cydnus emarginatus Stal." This was undoubtedly a lapsus calami as the insect was originally described as a member of the genus Cyrtomenus.

Except for an occasional notation of "Collected at light," no ecological data were found on any of the specimens.

SPECIMENS STUDIED: 13 males, 30 females. MEXICO: Vera Cruz: Atoyac, Cordoba, Jesus Carranza; May. GUATEMALA: Morales; August. BRITISH HONDURAS: Punta Gorda; July. COSTA RICA: Cairo; April. FRENCH GUIANA: Mara River, (Oyapok River), Pied Saut.; May. BRAZIL: Chapada, Monlevade, Natterer, Rio Madeira, Vicossa (Minas Gereas), Vigoss (Minas Gereas); May, September. PERU: Tingo Maria; May.

Cyrtomenus (Syllobus) grossus Dallas

1851 Cyrtomenus grossus Dallas, List. Hemip. Brit. Mus., 1:111.

1867 Cyrtomenus grossus Walker, Catal. Hemip. Brit. Mus., 1:147.

1876 Cyrtomenus grossus Stal, Svenska Vet.-Ak. Handl., 14(4):18.

1880 Cyrtomenus grossus Distant, Biol. Centr.-Amer., Rhynch., 1:2, pl. 2, fig. 14.

1881 Cyrtomenus grossus Signoret, Ann. Soc. Ent. France, (6) 1:198, pl. 16, fig. 18.

1886 Cyrtomenus grossus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cyrtomenus grossus Lethierry and Severin, Gen. Catal. Hemip., 1:62.

DIAGNOSIS: The very great width of the interocular part of the head, which here is greater than the length of the head, will permit ready recognition of this species within the subgenus.

DESCRIPTION: (based on one male and two females) MALE:- oval, outline of costa not continuing nor paralleling lateral margins of pronotum but more abruptly flaring posteriorly. HEAD: length more than half width, 1.69: 2.79; interocular width, 1.89; anterior outline flatly rounded, clypeus slightly shorter than juga, narrowed apically; surface shining, with faint, radiating rugae and minute, widely scattered punctures; ocelli small to moderate, separated from eye by space nearly or quite equalling twice transverse ocellar width; jugum ventrally and maxillary plate shining, impunctate; antennal I, 0.61: II, 0.46: III, 0.80: IV, 0.73: V, 0.74; bucculae about half as high as labial II; labium surpassing posterior coxae, sometimes reaching to sternite IV, segments, I, 1.26: II, 2.06: III, 2.19: IV, 1.63. PRONOTUM: length more than half width, 3.75: 6.30; lateral margin straight on basal two-thirds, with submarginal row of twelve setigerous punctures; anterior lobe with intermixed coarse and fine punctures laterally and in subapical band paralleling anterior margin with broad, shallow basin-like depression over most of middle third; posterior lobe with few minute and fewer coarse punctures scattered irregularly across width. SCUTELLUM: length more than width, 4.20: 3.91; disc polished, with about half dozen coarse punctures and several fine ones widely scattered. HEMELYTRON: clavus and corium shining; clavus with single row of coarse punctures and several finer scattered ones; mesocorium with one complete and one partial row of punctures paralleling claval suture, punctation elsewhere not dense, absent medially; exocorium less densely punctured than mesocorium; costa with five

or six setigerous punctures; membrane distinctly surpassing apex of abdomen. PROPLEURON: polished, with few small punctures in depression. MESOPLEURON: lateral area with few oblique rugulae. METAPLEURON: lateral margin of evaporatorium oblique, concave; lateral area impunctate. LEGS: posterior tibia distinctly compressed, gently widened to apical third. STERNITES: polished, minutely punctate, with several short rugae in spiracular area. TERMINALIA: genital capsule shining, irregularly punctate, more densely so laterally, apical margin slightly concave either side of small, median angulation; gonostylus as illustrated (Fig. 242). LENGTH of body, 10.71.

FEMALE:- similar to male but differing in less distinct subapical impression on pronotum; more distinct rugae on head and more uniform punctation on apical two-thirds of corium. HEAD: length: width:: 1.93 (1.91-1.95): 2.91 (2.86-2.96); interocular width, 2.02 (2.02-2.02); antennals, I, 0.61 (0.60-0.62): II, 0.52 (0.50-0.55): III, 0.73 (0.67-0.80): IV, 0.71 (0.70-0.73): V, 0.81 (0.80-0.83); labials, I, 1.19 (1.16-1.23): II, 1.87 (1.86-1.89): III, 2.27 (2.12-2.42): IV, 1.64 (1.56-1.72). PRONOTUM: length: width:: 3.75 (3.75-3.75): 6.30 (6.28-6.32). SCUTELLUM: length: width:: 4.86 (4.80-4.92): 3.90 (3.90-3.91). LENGTH of body, 11.03 (10.90-11.08).

TYPE DATA: Dallas (loc. cit.) described this species from "Columbia [?]". The type is now in the British Museum of Natural History.

DISTRIBUTION: One each of the three specimens examined came from Mexico, Guatemala and Ecuador.

DISCUSSION: Notes based on the type and furnished by Dr. W. E. China in correspondence has enabled the author to associate Dallas' name with this form. Grossus and teter are rather closely allied to each other but

separate easily from the other two forms in the subgenus as indicated in the key. From each other, these forms may be best separated by the head and costal characters listed in the key, but in addition one may often use the greatly elongated labium which in grossus always reaches sternite IV and in teter seldom surpasses the posterior coxae.

SPECIMENS STUDIED: 1 male, 2 females. MEXICO: Chiapas: Tacana Volcano, 9,100 feet, 3, 30, 1939, P. Brodkorb, 1f (MMZ). GUATEMALA: Purulha, 5/16, 1f (USNM). ECUADOR: El Tobo, X-5-44, E. J. Hambleton, 1m (USNM).

Cyrtomenus (Syllobus) marginalis Signoret

1881 Cyrtomenus marginalis Signoret, Ann. Soc. Ent. France, (6) 1:201, pl. 6, fig. 21.

1893 Cyrtomenus marginalis Lethierry and Severin, Gen. Catal. Hemip., 1:62.

DIAGNOSIS: The elongate second antennal segment, which is here equal in length to the third, or the large number of setigerous punctures in lateral submarginal row on the pronotum, or the numerous setigerous punctures on the costa will separate marginalis from all other members of the genus.

DESCRIPTION: FEMALE:- (based on only specimen seen, the type female) HEAD: length more than half width, 1.23: 1.82; interocular width, 1.04; anterior outline broadly semicircular, juga longer than clypeus, converging and contiguous above its apex; eyes projecting beyond outline of head by about half transverse diameter; surface shining, jugum with prominent radiating rugae and numerous close-set, intermixed moderate and fine punctures; ocelli large, separated from eye by space about half transverse ocellar width; jugum ventrally smooth, impunctate; maxillary plate alutaceous, with irregular, coarse punctures posteriorly; antennals, I, 0.36: II, 0.43:

III, 0.43; IV and V missing; bucculae not as high as labial II; labium broken, only first segment present, I, 0.56. PRONOTUM: (posterior margin partly broken in type) length more than half width, 2.42: 4.19; lateral margin weakly arcuate from base to apical fourth, thence more abruptly incurved, with submarginal row of twenty-five setigerous punctures; transverse impression weak, with moderate punctures similar to and marging with punctation across entire anterior half of posterior lobe; latter with minute, widely scattered punctures on posterior half; anterior lobe with broad submarginal band apically and broader submarginal band laterally and narrower midline with punctures similar to those of transverse impression, subapical band with minute punctures interspersed. SCUTELLUM: length less than width, 2.56: 2.71; discal punctures irregular, much more dense than those of mesocorium, slightly more abundant laterally but not arranged in single, regular series; apex shining, impunctate. HEMELYTRON: shining; clavus with several incomplete rows of punctures; meso- and exocorium with several widely spaced, moderate punctures; costa with twenty-one to twenty-three setigerous punctures. MESOPLEURON: lateral area with few longitudinal rugae. STERNITES: all, except ultimate, roughened laterally, with irregular post-median row of prominent setigerous punctures. LENGTH of body, 7.07.

TYPE DATA: Signoret's type specimen was a female now in the collection of the Naturhistorisches Museum in Vienna. Although the original description gave no locality, personal examination of the type showed it to bear two labels, "Brasil, Coll. Signoret," and Signoret's determination label "marginal."

DISTRIBUTION: The only specimen seen was the type from Brazil. Distant (1899) accredited Dallas' (1851) record of Aethus ciliatus from

Colombia to this strongly marked species. However, Dr. W. E. China, Deputy Keeper of Insects at the British Museum of Natural History, informed the author in correspondence that Dallas' specimen has only seven costal setigerous punctures, thus preventing acceptance of Distant's conclusions.

DISCUSSION: Through the kindness of Dr. Max Beier and the Naturhistorisches Museum in Vienna, Signoret's type was made available for study. The specimen is in fair condition lacking antennals IV and V, labials III and IV and the apex of II (dermestid damage?) and all tarsi and the pronotum is fractured. In the original description the equality of antennals II and III was noted. This is an unusual feature within the genus and suggested that the species had not been properly placed. However, the type not only shows the antennal condition as described by Signoret, but also has the general shape and osteolar and leg modifications of Cyrtomenus, thereby confirming the generic assignment.

Cyrtomenus (Syllobus) teter (Spinola)

1837 Cydnus teter Spinola, Essai Hemip., p. 332.

1851 Cyrtomenus teter Dallas, List Hemip. Brit. Mus., 1:111.

1867 Cyrtomenus teter Walker, Catal. Hemip. Brit. Mus., 1:147.

1876 Cyrtomenus teter Stal, Svenska Vet.-Handl., 14(4):18.

1880 Cyrtomenus excavatus Distant, Biol. Centr.-Amer., Rhynch., 1:2, pl. 2, fig. 12.

1880 Cyrtomenus teter Distant, Biol. Centr.-Amer., Rhynch., 1:2, pl. 2, fig. 12.

1881 Cyrtomenus teter Signoret, Ann. Soc. Ent. France, (6) 1:197, pl. 6, fig. 17.

1886 Cyrtomenus teter Uhler, Checklist Hemip. N. Am., p. 3.

1917 Cyrtomenus teter Van Duzee, Univ. California Pubs. Ent., 2:18.

1939 Cyrtomenus teter Torre Bueno, Ent. Amer., 19:177.

DIAGNOSIS: This species may be recognized by a combination of three features: 1) regularly rounded outline of head, 2) less than ten setigerous punctures on costa, and 3) the short labium which does not or only very slightly surpasses the posterior coxae.

DESCRIPTION: MALE:- HEAD: length more than half width, 1.79 (1.69-1.91): 2.63 (2.60-2.70); interocular width, 1.68 (1.56-1.75); anterior outline a flattened semicircle, clypeus nearly or quite as long as juga, moderately to strongly narrowed apically; surface shining, with faint to moderate, radiating rugae, punctation fine or absent; ocelli large, separated from eye by space slightly greater than transverse ocellar width; jugum ventrally and maxillary plate shining, impunctate; antennals, I, 0.56 (0.51-0.60): II, 0.41 (0.36-0.45): III, 0.67 (0.66-0.70): IV, 0.72 (0.70-0.73): V, 0.71 (0.70-0.73); bucculae low, about half as high as labial II; labium reaching between or slightly beyond posterior coxae, segments, I, 1.10 (1.01-1.16): II, 1.59 (1.50-1.66): III, 1.66 (1.60-1.69): IV, 1.34 (1.23-1.40). PRONOTUM: length more than half width, 3.66 (3.31-3.83): 6.15 (5.70-6.27); lateral margin with sixteen to eighteen setigerous punctures submarginally; transverse impression more strongly impressed laterally than medially, marked with irregular, medially interrupted row of coarse punctures; anterior lobe impunctate except for few punctures laterally and irregular, transverse row of coarse punctures subapically; posterior lobe polished, with few widely scattered punctures. SCUTELLUM: length subequal to width, 4.13 (4.05-4.20): 4.12 (4.05-4.19); disc impunctate or with few

widely scattered punctures. HEMELYTRON: clavus and corium polished; clavus with one complete row of punctures, sometimes also with several scattered punctures; mesocorium with two rows of punctures paralleling claval suture, outer row usually interrupted medially, elsewhere closely punctate; exocorium with punctation much more sparse than on mesocorium; costa with five to seven setigerous punctures; membrane distinctly surpassing apex of abdomen. PROPLEURON: shining, with few small punctures in depression. MESOPLEURON: lateral area impunctate, obliquely rugulose. METAPLEURON: lateral area impunctate. LEGS: posterior tibia distinctly compressed, not expanding toward apex. STERNITES: polished, minutely punctate. TERMINALIA: genital capsule polished, irregularly punctate, more densely so laterally, apical margin slightly concave either side of small, median angulation; gonostylus as illustrated (Fig. 241). LENGTH of body, 11.19 (10.36-11.55).

FEMALE:- similar to male except that subapical pronotal impression is greatly reduced and scutellum is usually longer than wide. HEAD: length: width:: 1.76 (1.49-1.95): 2.61 (2.34-2.76); interocular width, 1.63 (1.56-1.75); antennals, I, 0.57 (0.53-0.63): II, 0.40 (0.36-0.43): III, 0.68 (0.63-0.73): IV, 0.68 (0.63-0.73): V, 0.71 (0.70-0.73); labials, I, 1.16 (1.06-1.26): II, 1.65 (1.56-1.69): III, 1.75 (1.60-2.06): IV, 1.35 (1.23-1.56). PRONOTUM: length: width:: 3.46 (2.73-3.75): 5.91 (5.17-6.29). SCUTELLUM: length: width:: 4.05 (3.58-4.34): 3.78 (3.43-4.05). LENGTH of body, 10.15 (8.99-10.85).

TYPE DATA: The type specimen of teter Spinola (loc. cit.), whose present location has not yet been ascertained, had been reported as coming from "Brezil." The type of Distant's (loc. cit.) Cyrtomenus excavatus was described from "Costa Rica, Irazu," and is in the collection of the British

Museum of Natural History.

DISTRIBUTION: The present form is known from specimen records to occur from Guatemala south to southern Brazil.

DISCUSSION: Although the type was not studied in connection with the present work, there appears to be no reason to disagree with the unanimous association of Spinola's name with the present form. In the original description of excavatus, Distant enumerated certain differences between his supposed new species and teter, but these differences were simply sexual, Distant having redescribed the male under a new name. None of the specimens examined bore any comments as to the conditions under which it had been captured.

SPECIMENS STUDIED: 11 males, 33 females. GUATEMALA: Coban; July. COSTA RICA: Pacayas, S. Lucas. PANAMA: El Volcan (Chiriqui), Poteillos; February, May. BRAZIL: Cuana, Corupa, Espirito-Santo, Nova Teutonia, Rio Natal (S. Cath.), Rio Negro (Parana), Rio Verelho (S. Cath.), Santa Cruz, Sao Paulo, Serra dos Orgaos, Therezopolis, Vicosa; September to February.

Subgenus Cyrtomenus Amyot and Serville

1843 Cyrtomenus Amyot and Serville, Hist. Nat. Hemip., p. 90.

DIAGNOSIS: Size moderate, length of body 6.4-8.6. HEAD: juga rounded, equalling, longer than or surpassing and contiguous at apex of clypeus. PRONOTUM: laterally with four to twelve setigerous punctures; males and females usually with similar, vague, subapical, median impression. STERNITES: polished; I and II and sometimes others with submarginal row of setigerous punctures giving rise to long, golden setae. LEGS: posterior tibia moderately to strongly compressed and often strongly expanded in apical third.

SUBGENOTYPE: Cyrtomenus castaneus Amyot and Serville (1843:91), subsequently designated by Kirkaldy (1903:230). This name is here considered as a synonym of Pentatoma ciliata Palisot Beauvois which becomes Cyrtomenus ciliatus (Palisot Beauvois) as the proper name for the common North American species which has long but erroneously gone under the name "Cyrtomenus mirabilis (Perty)." Fuller discussion of this problem is presented under C. ciliatus in the present paper.

DISTRIBUTION: The species of this subgenus occupy the area from eastern and central United States south through Central America and the West Indies into South America to central Argentina, i.e., the full range of the genus.

DISCUSSION: The four species belonging to this subgenus can be grouped in several ways by different sets of characters. If just the degree of dilation of the posterior tibia is considered (which may have significance in burrowing forms), the two very closely allied North American species separate from the other two, as follows:

Posterior tibia as broad as anterior tibia	ciliatus (P.B.) crassus Walk.
Posterior tibia narrower than anterior tibia	mirabilis (Perty) bergi n. name

But if the greater convexity of the body, the more strongly rugose head and the larger ocelli are contrasted with the less convex body, the flatter smoother head and the smaller ocelli, the arrangement would be like this:

Greater convexity; rugose head; large ocelli	ciliatus (P.B.) crassus Walk. mirabilis (Perty)
Less convex; smoother head; small ocelli	bergi n. name

A grouping similar to the one based on the degree of dilation of the posterior

tibia is possible if reference is made to the presence or absence of a postmedian, partial row of prominent setigerous punctures on the lateral third of sternites IV to VI, as indicated in the following couplet:

With setigerous punctures on lateral third of sternites IV to VI	*ciliatus* (P.B.) *crassus* Walk.
Without such setigerous punctures	*mirabilis* (Perty) *bergi* n. name

One notices immediately that the species *mirabilis* is the form that shifts position in these various associations. Obviously, it is not an extreme form, but probably occupies a somewhat intermediate position. In habitus it appears closest to the two North American forms, but separates from them on the absence of setigerous punctures on the lateral third sternites IV to VI and the less expanded hind tibia. The latter feature should not be passed over too lightly, because if one of the directions of evolution within the Cydnidae is towards greater efficiency of digging (which seems logical in view of what is known of the ecology of the group) the more strongly dilated posterior tibiae should have some significance within this subgenus.

Key to the Species of the Subgenus *Cyrtomenus*

1. Posterior tibia strongly compressed, greatest diameter subequal to that of anterior tibia; sternites IV to VI with post-median, partial row of prominent setigerous punctures at lateral third. . . 2

   Posterior tibia weakly to moderately compressed, greatest diameter not more than two-thirds width of anterior tibia; sternites IV to VI without setigerous punctures on lateral third. 3

2. Outline[1] of juga rounded, tending to be somewhat triangular (Fig. 56); about one-half of width of eye projecting laterally beyond postero-lateral angle of jugum. . . . . ciliatus (P.B.) p. 300

Outline of juga very broadly rounded and reflexed (Fig. 57); about one-third of width of eye projecting laterally beyond postero-lateral angle of jugum. . . . . crassus Walk. p. 306

3. Space separating ocellus from eye distinctly less than transverse ocellar width (12:20); surface of head distinctly convex, with coarse, radiating rugae. . . . . mirabilis (Perty) p. 311

Space separating ocellus from eye slightly more than transverse ocellar width (18:15); surface of head nearly smooth, almost without rugae. . . . . bergi n. name p. 295

Cyrtomenus (Cyrtomenus) bergi NEW NAME

1879 Cyrtomenus ciliatus Berg, Hemip. Argentina, p. 10 (nec Palisot Beauvois, 1805:186).

DIAGNOSIS: The smaller ocelli which are separated from the eyes by a space slightly greater than a transverse ocellar width or the absence of strong rugae on the head will mark this species as distinct from the other three in the subgenus.

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[1]Caution: in using this feature determine the amount of wear on the margin of the head by noticing the position of the margin of the head in relation to the submarginal row of setigerous punctures. This character may be negated by such wear. During the present study, it has been noticed that there appears to be a direct correlation between the amount of wear on the margin of the head and that shown by the dorsal margin of the anterior tibia. In extreme cases, even the tubercles that give rise to the dorsal spines of the anterior tibia may be completely abraded away. Such a situation may be used as a check for the amount of wear on the margin of the head.

DESCRIPTION: MALE:- length more than half width, 1.45 (1.11-1.62): 2.08 (1.71-2.47); interocular width, 1.34 (1.10-1.56); anterior outline nearly or quite a full semicircle, juga surpassing and converging or contiguous in front of clypeus; surface polished, with weak to obsolete, radiating rugae, impunctate, with minute punctures or with few distinct punctures anterior to ocelli; ocelli small to moderate, separated from eye by space little greater than transverse ocellar width; jugum ventrally weakly alutaceous, sometimes with few small punctures; maxillary plate strongly alutaceous and with crowded punctures; antennals, I, 0.47 (0.34-0.63): II, 0.27 (0.20-0.43): III, 0.47 (0.35-0.63): IV, 0.47 (0.40-0.53): V, 0.49 (0.46-0.90); bucculae about half as high as labial II; labium slightly surpassing apices of intermediate coxae, segments, I, 0.78 (0.53-1.06): II, 1.02 (0.70-1.40): III, 1.02 (0.70-1.46): IV, 0.77 (0.57-1.03). PRONOTUM: length more than half width, 2.58 (1.82-3.00): 4.63 (3.57-5.46); lateral margins straight on basal half, with submarginal row of fifteen to twenty setigerous punctures; transverse impression weakly to moderately impressed, obsolete or absent at middle, marked by irregular, interrupted row of coarse punctures; anterior lobe with weak subapical impression, with several coarse punctures laterally and in subapical band; posterior lobe with few to many coarse scattered punctures medially. SCUTELLUM: length less than width, 3.01 (2.26-3.60): 3.07 (2.25-3.73); disc with widely scattered, sunken, coarse punctures. HEMELYTRON: clavus and corium polished; clavus with one row of punctures medially; mesocorial punctures arranged in two rows paralleling claval suture, outer row often incomplete, discal punctures numerous, well-separated, often absent along radial vein; exocorium usually more sparsely punctate than mesocorium; costa with six

to eight setigerous punctures; membrane distinctly surpassing apex of abdomen. PROPLEURON: variable, from polished and impunctate to roughened by crowded, fine, longitudinal rugulae and small punctures. MESOPLEURON: lateral area shining, impunctate, with few oblique rugae. METAPLEURON: lateral area polished, impunctate. LEGS: posterior tibia compressed, very weakly expanded toward apex, greatest diameter much less than that of anterior tibia. STERNITES: polished, virtually impunctate except among longitudinal rugae in spiracular area. TERMINALIA: genital capsule polished, with several distinct punctures laterally, apical margin virtually straight; gonostylus as illustrated (Fig. 243). LENGTH of body, 7.32 (6.17-9.40).

FEMALE:- similar to male, anterior pronotal lobe without median, subapical impression. HEAD: length: width:: 1.42 (1.30-1.62): 2.07 (1.82-2.47); interocular width, 1.34 (1.23-1.52); antennals, I, 0.45 (0.40-0.53): II, 0.28 (0.23-0.34): III, 0.47 (0.40-0.56): IV, 0.46 (0.40-0.56): V, 0.51 (0.46-0.60); labials, I, 0.75 (0.66-1.00): II, 1.05 (0.86-1.50): III, 1.00 (0.83-1.66): IV, 0.78 (0.68-1.13). PRONOTUM: length: width:: 2.37 (2.11-2.84): 4.34 (3.90-5.02). SCUTELLUM: length: width:: 2.71 (2.54-3.45): 2.81 (2.54-3.13). LENGTH of body, 7.41 (6.72-9.00).

TYPE DATA: The type specimen of Cyrtomenus bergi, since it is proposed as a new name for the preoccupied Cyrtomenus ciliatus of Berg, not of Perty (1805:186), must be the same as that which served as the type for Berg's name. That specimen was cited in the original description as having come from "Provincia Bonaerensis," Argentina. Unfortunately, this type, as well as many of Berg's other types, appears to be lost.

DISTRIBUTION: The range occupied by members of this species as here

determined is quite extensive, extending from central Mexico, Grenada and Trinidad, south into South America as far as central Argentina.

DISCUSSION: Ever since Signoret (1881a) suggested that Cyrtomenus ciliatus Berg was the same species as another Cyrtomenus described by Palisot Beauvois (1805) as Pentatoma ciliata authors have accepted this placement. Examinations of the original descriptions indicate that such a position is untenable. First of all, the two forms were described from widely separated localities, Palisot Beauvois gave his type locality as "Etats-Unis d'Amerique," while Berg quoted his specimen as being from "Provincia Bonaerensis," Argentina. Since no species of the genus Cyrtomenus is known to occur in both of these places one doubts Signoret's conclusions. Secondly, Berg described his species as having the head "subrugose," a statement that can scarcely fit the species known from the United States. As the two forms thus appear to be distinct, Palisot Beauvois' name cannot be used for a South American form as was done by Signoret, but must be reserved for a northern species, i.e., one from the United States. In the present paper Palisot Beauvois' name is assigned to the common Cyrtomenus of the southern United States, the one that has long gone under the name mirabilis of authors but not of Perty. Further discussion of this point will be found under the name Cyrtomenus ciliatus.

Even though ciliatus Berg is not a synonym of ciliatus Palisot Beauvois, it is a junior homonym and so must receive a new name. The new name bergi is here proposed.

Bergi, whether a single species of a species complex, presents a real problem because of its very extensive distribution and great amount of variability in several features which appear to grade from one extreme to

another. This variability was most conspicuous in four characters, as follows: 1) the length of the body varied from 6.17 to 9.40, with the larger specimens mostly from the more northern localities and appearing (maybe deceptively so) slightly more robust. As yet, this cannot be indicated in a definitive way and so is not followed further.

2) Measurements indicated that the segments of the labium were the most variable structures, not only in the actual measurements but also in proportions. Unfortunately, these measurements and proportions showed no discontinuity that could be relied upon for separations.

3) Dorsal punctation was moderately uniform throughout the series except that toward the sides of the pronotum, especially of the anterior lobe. Ventrally, surface sculpture offered little help for separating characters except on the propleurae. For some time one group of specimens was separated from all the others on the basis of the propleural sculpture. These specimens had the anterior propleural convexity distinctly dulled by prominent alutaceousness and often longitudinal striae and fine punctures, and the depression and posterior convexity coarsely, transversely striated and often with coarse punctures. This worked very satisfactorily in contrast to the other extreme of highly polished surfaces. But study of additional specimens found so many intermediates that repeated separations of the same material on these characters rarely resulted in the same placement of any but the extremes.

Finally, 4) the male gonostyli also offered some variability which, on the basis of the several specimens studied for this structure, was gradual rather than discontinuous and so could not be used for a separating feature.

Besides the usual occasional specimen with the comment "collected at

light," there was in the material studied a sizeable series of unusually small specimens from Surinam labelled "in coffee field," and one specimen from Venezuela with the note, "on potato."

SPECIMENS STUDIED: 83 males, 166 females. MEXICO: Tabasco: Fontera; June. Vera Cruz: Orizaba. GUATEMALA: Champerico, Morales; January, May. GRENADA (B.W.I.): Leeward side. TRINIDAD: Port of Spain, St. Augustine; January. COLOMBIA: Rio Guayuriba Meta; December. VENEZUELA: Boqueron, Caracas, Rubio Edo Tochira; June, October. BRITISH GUIANA: Kartabo; June. SURINAM: "Surinam." BRAZIL: Bahia, Chapada, Dist. Federal, Esperito Santo, Independencia, New Teutonia, Para, Pernambuco, Rio de Janeiro, Rio Grande du Sol, Sabara-Bello Horitonte, San Mauro, Santarem, Sao Paulo, Taperina, Vicosa; June, October to March. PERU: Achinamiza, Chanchamayo, Iquitos, Rio Pampas, Tingo Maria; January to May. BOLIVIA: Coroica, Nuflo de Chavez, Puerto Swarez, Prov. Sara, Rio Cristal Maru - 50 mi. N. E. Cochabamba, Rurrenabaque (Beni), Sta. Cruz de la Sierra, Tiguipa; April, October to December. PARAGUAY: Asuncion, Horqueta, Villarrica; May, September to December. ARGENTINA: Alta Garcia, Cordoba, La Plata, Rosario, Tucuman; January, May, October.

Cyrtomenus (Cyrtomenus) ciliatus (Palisot Beauvois) (Fig. 10)

1805 Pentatoma ciliata Palisot Beauvois, Ins. Rec. Afrique et Amerique, p. 186, pl. 11, fig. 6.

1843 Cyrtomenus castaneus Amyot and Serville, Hist. Nat. Ins., Hemip., p. 91.

1843 ? Cydnus ciliatus Amyot and Serville, Hist. Nat. Ins., Hemip., p. 62.

1867 Cyrtomenus castaneus Walker, Catal. Hemip. Brit. Mus., 1:147.

1867 Cyrtomenus mutabilis Walker, Catal. Hemip. Brit. Mus., 1:147 (part).

1876 Cyrtomenus castaneus Stal, Svenska Vet.-Akad. Handl., 14(4):18.

1876 Pentatoma ciliata "loc. incert." Stal, Svenska Vet.-Akad. Handl., 14(4):26.

1877 Cyrtomenus mutabilis Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:367 (part).

1879 Cyrtomenus ciliatus Berg, Hemip. Argentina, p. 9 (part).

1879 Cyrtomenus mirabilis Berg, Hemip. Argentina, p. 9 (part).

1880 Cyrtomenus mirabilis Distant, Biol. Centr.-Amer., Rhynch., 1:3 (part).

1881 Cyrtomenus mirabilis Signoret, Ann. Soc. Ent. France, (6) 1:199 (part, not figure).

1886 Cyrtomenus mirabilis Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cyrtomenus mirabilis Lethierry and Severin, Gen. Catal. Hemip., 1:62 (part).

1910 Cyrtomenus mirabilis Banks, Catal. Nearct. Hemip., p. 99.

1917 Cyrtomenus mirabilis Van Duzee, Univ. California Pubs. Ent., 2:18 (part).

1939 Cyrtomenus mirabilis Torre Bueno, Ent. Amer., 19:177.

DIAGNOSIS: The strongly compressed posterior tibia whose width equals that of the anterior tibia marks this species from all its congenors except crassus Walker. From crassus it can be told by the less broadly rounded anterior outline of the head and the more strongly projecting eyes (Figs. 56 and 57).

DESCRIPTION: MALE:- HEAD: length more than half width, 1.44 (1.30-1.56): 2.12 (1.95-2.28); interocular width, 1.28 (1.23-1.36); anterior outline (Fig. 56) somewhat triangular, juga slightly longer than clypeus and convergent beyond it; eyes projecting by about one-half their width; surface decidedly convex, shining, with prominent coarse rugae radiating from base of clypeus, minutely punctate; ocelli very large, separated from eye by

space about half transverse ocellar width; jugum ventrally shining, partly rugulose; maxillary plate alutaceous, with numerous distinct punctures; antennals, I, 0.40 (0.36-0.43): II, 0.29 (0.26-0.31): III, 0.44 (0.40-0.48): IV, 0.46 (0.43-0.50): V, 0.48 (0.46-0.50); bucculae less than half as high as labial II; labium reaching between posterior coxae, segments, I, 0.83 (0.73-0.96): II, 1.11 (0.93-1.23): III, 1.06 (0.93-1.16): IV, 0.91 (0.83-1.00). PRONOTUM: length more than half width, 2.65 (2.58-2.85): 4.56 (4.41-5.10); lateral margins straight on basal two-thirds, with submarginal row of twelve to fourteen setigerous punctures; transverse impression moderately impressed, marked by rather regular, medially interrupted row of coarse punctures; anterior lobe with broad, shallow, subapical impression, with punctures confined to subapical band and lateral patch; posterior lobe with several coarse punctures medially and few others scattered elsewhere. SCUTELLUM: length subequal to, slightly less or slightly more than width, 3.23 (3.15-3.45): 3.13 (2.86-3.31); disc with few to several widely scattered, coarse, sunken punctures. HEMELYTRON: clavus and corium polished; clavus with one submedian row of punctures; mesocorial punctation moderate, abundant except along radial vein, forming two rows paralleling claval suture, outer one usually incomplete; costa with six to eight setigerous punctures; membrane distinctly surpassing apex of abdomen. PROPLEURON: shining, with few fine punctures laterad of acetabulum and few coarse punctures in depression. MESOPLEURON: (Fig. 109) lateral area alutaceous or polished, with few oblique rugae. METAPLEURON: (Fig. 109) lateral margin of evaporatorium bisinuate; lateral area shining, impunctate. LEGS: posterior tibia (Fig. 142) with greatest diameter equalling that of anterior tibia (Fig. 123), latter with seven or eight stout, flattened, blunt spines arising from

blackened elevations on dorsal margin. STERNITES: shining, polished or faintly alutaceous, rugulose in spiracular area; setigerous punctures on III to VII prominent, with long setae. TERMINALIA: genital capsule shining, with scattered fine punctures; gonostylus as illustrated (Fig. 244). LENGTH of body, 7.63 (6.73-7.94).

FEMALE:- very similar to male in shape, punctation and subapical pronotal impression; measurements somewhat larger, especially of labial II. HEAD: length: width:: 1.49 (1.43-1.56): 2.16 (2.08-2.24); interocular width, 1.33 (1.23-1.43); antennals, I, 0.41 (0.36-0.46): II, 0.28 (0.23-0.33): III, 0.45 (0.43-0.50): IV, 0.40 (0.38-0.43): V, 0.47 (0.40-0.53); labials, I, 0.90 (0.83-1.00): II, 1.21 (1.13-1.33): III, 1.07 (1.03-1.13): IV, 0.97 (0.93-1.04). PRONOTUM: length: width:: 2.75 (2.71-2.97): 4.76 (4.46-5.09). SCUTELLUM: length: width:: 3.29 (3.14-3.45): 3.30 (3.30-3.30). LENGTH of body, 7.75 (7.33-7.97).

TYPE DATA: The author has been unable to locate Palisot Beauvois' type which was from "Etats-Unis d'Amerique." Amyot and Serville's type of castaneus was from "Amerique Septentrionale." This type is also as yet unlocated.

DISTRIBUTION: The range of this species as indicated by specimens examined extends coast-wise in the United States from New Jersey south and west to Florida and Texas thence north in the Mississippi basin to Illinois, Missouri and Kansas.

DISCUSSION: This species has long gone under the name mirabilis Perty (the earlier usage of the spelling mutabilis appears to be due to an error on the caption of the plate accompanying the original description). However, the larger size, "4¼" " or 8.9 millimeter and the type locality

"Provincia Piauhiensis," Brazil, indicate that this name has been improperly applied by most authors and actually belongs to a larger South American species of the genus. The earliest published name assignable to this genus, ciliata Palisot Beauvois, appears to be the correct one for the present species. The type locality, "Etats-Unis d'Amerique," and the illustration of a stout, compact body 7 millimeters long agree well with the species at hand and could belong to no other form, except possibly crassus Walker. Crassus, however, occurs only in the southwestern part of the continent, an area that did not belong to the United States in the early 1800's. The synonymy also includes the Cyrtomenus castaneus of Amyot and Serville, a name which also probably belongs to this species as has been indicated by Uhler (1877) and others.

The relationship between Cyrtomenus ciliatus, crassus and mirabilis (in the sense of the present paper) is not yet fully evident. That there is close morphological relationship between them is observable. Also, their respective ranges are separate, yet adjacent and form a north-south sequence from central North America to southern South America. Such evidence suggests that perhaps these forms do not represent three distinct species, but subspecies of one widely ranging form; or, if the discontinuities disappear with the examination of additional material from the critical regions, a clinal development of but one form which will have to take the name ciliatus as that is the oldest one applied to any member of the group. At present, however, the author believes that our knowledge of these forms, as well as of most of the rest of the family, is so fragmentary that application of the "new systematics" to it should definitely await the accumulation of more material and more intensive revisions.

An additional feature that may be used to separate ciliatus from crassus is the presence of more stout, blunt spines on the dorsal margin of the anterior tibia of the latter form. In the specimens of ciliatus examined, none of them showed more than seven or eight of these blunt spines, but they did often show tapering spines basad of the series. These latter may make interpretation of this feature difficult until a little experience is gained, as crassus shows nine or ten blunt spines. But specimens of crassus also show the additional tapering spines basad of the series. With some experience, however, one can learn to recognize the greater space between the spines, especially on the apical third, as it occurs on the tibia of ciliatus (Fig. 123). In crassus the spines of the same region are more numerous and closely spaced.

Collecting notes and field experience indicate that ciliatus is a species of sandy areas and that it frequently comes to light after dark. One specimen from Louisiana bore the label, "with sweet potato." Another small collection of adults and nymphs was noted on "Chufa" in Mississippi; and Hart (1919:205) reported nymphs and adults "from Georgia as injurious to the chufa, or edible sedge-root (Cyperus esculentus L.)."

The several nymphs seen belonged to later instars and all showed the typical hind tibia, the convex, coarsely rugose head and the submarginal row of spines on the head which are characteristic of the adults.

SPECIMENS STUDIED: 96 males, 119 females. UNITED STATES: Alabama: Mobile; June. Delaware: Newark; July. Florida: Branford, Clearwater, Dunnellen, Ft. Lauderdale, Fort Myers, Fruitville, Gainesville, Indian River, Jackson, La Belle, Lacoochee, Lake City, Lakeland, Lake Placid, Lutz, McClenny, Miami, Putnam Co., Red Level, St. Petersburg, Sandford, Seven Oaks, Stemper,

Suwanee Springs, Tallahassee; April to November. Georgia: Bainbridge, Hunter Field, Okefenokee Swamp; June to September. Illinois: Cairo, Harrisburg, Thomasville, Waycross; June to September. Kansas: Ellsworth; September. Louisiana: Gulfport. Mississippi: Lucedale; June, November. Missouri: Charleston, Kansas City, St. Louis; June to August. New Jersey: Manahawkin; August. North Carolina: Southern Pines; July. Oklahoma: Elmer, Lugert, Oswalt, Payne Co.; July, August. South Carolina: Allendale, Charleston, Florence, Port Royal; July. Texas: Brazos Co., Burkburnett, Colorado City, Columbus, El Paso, Hidalgo Co., Sequin; May to August. Virginia: Virginia Beach; August.

Cyrtomenus (Cyrtomenus) crassus Walker

1867 Cyrtomenus crassus Walker, Catal. Hemip. Brit. Mus., 1:147.

1877 Cyrtomenus obtusus Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:369.

1880 Cyrtomenus mirabilis Distant, Biol. Centr.-Amer., Rhynch., 1:3 (part).

1881 Cyrtomenus mirabilis Signoret, Ann. Soc. Ent. France, (6)1:199 (part, not figure).

1886 Cyrtomenus mirabilis Uhler, Checklist Hemip. N. Am., p. 3 (part).

1903 Cyrtomenus vestigiatus Distant, Trans. Ent. Soc. London, 1903:525.

1917 Cyrtomenus mirabilis Van Duzee, Univ. California Pubs. Ent., 2:18.

DIAGNOSIS: The very broadly rounded anteocular part of the head beyond which the eyes project only slightly (Fig. 57) added to the presence of a postmedian row of setigerous punctures on lateral third of sternites IV to VI will separate this species from all others in the subgenus.

DESCRIPTION: MALE:- HEAD: length more than half width, 1.50 (1.43-1.62): 2.20 (2.08-2.36); interocular width, 1.37 (1.30-1.49); anterior outline very

broadly rounded (Fig. 57), eyes projecting beyond sides of head by not more than one-third their width, juga longer than clypeus and nearly or quite contiguous in front of it; apices of juga and clypeus broadly recurved; surface noticeably convex, shining, with prominent, coarse, irregular rugae radiating from base of clypeus, minutely punctate; ocelli large, separated from eye by space slightly more than half transverse ocellar width; jugum ventrally shining, in part obsoletely rugulose; maxillary plate alutaceous, with numerous shallow punctures; antennals, I, 0.44 (0.43-0.46): II, 0.30 (0.30-0.33): III, 0.47 (0.43-0.50): IV, 0.45 (0.40-0.50): V, 0.47 (0.46-0.50); bucculae less than half as high as labial II, labium reaching between posterior coxae, segments, I, 0.89 (0.86-0.99): II, 1.21 (1.13-1.33): III, 1.06 (0.96-1.16): IV, 0.87 (0.83-0.94). PRONOTUM: length more than half width, 2.83 (2.69-3.00): 5.01 (4.81-5.40); lateral margin straight to slightly concave on basal two-thirds, with submarginal row of fifteen to eighteen setigerous punctures; transverse impression distinct laterally, obsolete medially, medially interrupted, irregular row of coarse, close-set punctures; anterior lobe impunctate except for few moderate punctures laterally and in subapical band, median subapical impression broad, very shallow; posterior lobe with several coarse punctures anteriorly, these more numerous medially. SCUTELLUM: length subequal to, slightly longer or shorter than width, 3.30 (3.15-3.60): 3.33 (3.14-3.71); disc with few to several widely scattered coarse, sunken punctures. HEMELYTRON: clavus and corium shining; clavus with one submedian row of punctures; mesocorial punctation forming two rows (outer one incomplete) paralleling claval suture, elsewhere, except along radial vein, uniformly punctate; exocorium more irregularly and less densely punctate than mesocorium; costa with six to ten

setigerous punctures; membrane distinctly surpassing apex of abdomen. PROPLEURON: shining, with few distinct punctures in depression. MESOPLEURON: lateral area polished, impunctate, with few oblique rugulae. METAPLEURON: lateral margin of evaporatorium more or less concave; lateral area polished, impunctate. LEGS: posterior tibia (as in Fig. 142) strongly dilated toward apex, greatest diameter there equal to that of anterior tibia; latter with nine or ten stout, flattened, blunt spines arising from blackened elevations on dorsal margin. STERNITES: shining, polished or faintly alutaceous, rugulose in spiracular area; setigerous punctures on segments III to VII prominent, with long setae. TERMINALIA: genital segment shining, with scattered fine punctures; apical margin straight; gonostylus as illustrated (Fig. 245). LENGTH of body, 8.17 (7.93-8.66).

FEMALE:- similar to male. HEAD: length: width:: 1.51 (1.43-1.62): 2.31 (2.21-2.37); interocular width, 1.41 (1.36-1.49); antennals, I, 0.44 (0.43-0.46): II, 0.30 (0.26-0.33): III, 0.51 (0.50-0.53): IV, 0.49 (0.43-0.53): V, 0.49 (0.43-0.53); labials, I, 0.91 (0.86-0.96): II, 1.23 (1.20-1.30): III, 1.07 (1.00-1.16): IV, 0.91 (0.83-1.00). PRONOTUM: length: width:: 2.97 (2.84-3.02): 5.21 (5.10-5.38). SCUTELLUM: length: width:: 3.53 (3.44-3.60): 3.58 (3.42-3.61). LENGTH of body, 8.67 (8.40-8.98).

TYPE DATA: Walker (loc. cit.) described crassus from "Vera Cruz," Mexico. His type is in the British Museum of Natural History. Obtusus was described by Uhler (loc. cit.) from "Texas, Arizona, and perhaps the same as that from Cape Saint Lucas, Lower California." These specimens are in the collection of the United States National Museum. Distant's (loc. cit.) vestigiatus, the type of which is now in the British Museum in London, was described from "Costa Rica, San Jose."

DISTRIBUTION: As now understood, crassus occurs in the area from Arizona south into Central America to Costa Rica and then eastward on the island of Cuba.

DISCUSSION: In previous literature this species had generally been considered synonymous with ciliatus P. B. (= mirabilis auct., nec Perty). Although the two are admittedly very closely allied, they may be separated by the features given in the key to species. In addition, the range of crassus is distinct from that of ciliatus, being definitely more southern. Obtusus Uhler has likewise been considered a synonym of ciliatus, but both the description and the type locality leave little doubt that it is the same form as crassus. It is surprising that no one has previously recognized the identity of Uhler's obtusus and Distant's vestigiatus. Both authors compared their specimens to "mirabilis" and pointed out several of the same separating features, as in the following statements of comparison with "mirabilis:"

obtusus Uhler	vestigiatus Distant
HEAD: more deeply emarginate in front	HEAD: cleft at apices
PRONOTUM: punctures less numerous	PRONOTUM: sparingly, strongly punctate
SCUTELLUM: very coarsely and sparingly punctate	SCUTELLUM: very sparingly but very coarsely punctate

Additional comments on the close relationship of the present form with the other species of the subgenus will be found in the introductory discussion of the subgenus and under the species ciliatus. The present understanding of this species would not have been possible without the kind full answers that Dr. W. E. China supplied to questions about the types of Dallas, Walker and Distant, and the replies from Dr. R. I. Sailer concerning Uhler's type of obtusus.

Ecological data are sparse for this species. One specimen from Texas was labelled simply "corn." Uhler, in the notes accompanying his original description of obtusus, reported that considerable wear and breakage was evident on the head and front legs of some of his specimens. Many of the specimens examined during the present study, especially those from Texas and Arizona, also showed considerable wear. In fact, one series of these specimens had most of the margin of the head worn off past the interocular area. The anterior tibiae of these specimens were literally reduced to virtually unarmed stumps, the tarsi and all spines except those on the ventral margin were broken away and even the prominent tubercles that gave rise to the dorsal row of spines were nearly all completely worn down so that the width was reduced and the dorsal margin was only slightly crenulate. Since the members of this species show so much drastic wear, one wonders what significance this might have. As conjecture, one might suggest that the insects live in a more abrasive soil or are more aggressive in their burrowing. There was nothing but further conjecture to suggest that the cuticula might be softer here than elsewhere in the family.

SPECIMENS STUDIED: 45 males, 66 females. UNITED STATES: Arizona; Baboquivari Mts., Carr Cyn. (Huachuca Mts.), Chiricahua Natl. Mon. (Cochise Co.), Douglas, Gragoon, Ft. Grant, Globe, Patagonia, Ruby, Sabino Basin (St. Catalina Mts.), Tombstone, Tucson, Wickenberg, Wilcox; June to August. New Mexico: Tucumcari; July. Texas: Ysleta; September. MEXICO: Chihuahua: Camargo, Caterinas, Las Delicias, Matachic, Meoqui, Parral, Primavera; July to September. Coahuila: Torreon. Distrito Federal: Guadalu. Guanajuata: Gonzales Jct., Irapuato. Guerrero: Balzas. Lower California: Miraflores, Triunfo; July. Morales: Alpuyeca, Cuernavaca; June, September. Sonora:

Naco; August. Vera Cruz: Pureza; June. CUBA: San Blas; May. GUATEMALA: Antigua; June. HONDURUS: Zamorana (2,600'); July. COSTA RICA: San Jose; May.

Cyrtomenus (Cyrtomenus) mirabilis (Perty)

1830 Cydnus mirabilis Perty, Delect. Anim. Artic., p. 166, pl. 33, fig. 6 (erroneously labelled as "mutabilis" on caption of plate).

1851 Cyrtomenus mutabilis Dallas, List. Hemip. Brit. Mus., 1:112.

1867 Cyrtomenus mutabilis Walker, Catal. Hemip. Brit. Mus., 1:147 (part).

1876 Cyrtomenus mirabilis Stal, Svenska Vet.-Ak., Handl., 14(4):18.

1877 Cyrtomenus mutabilis Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:367 (part).

1879 Macroscytus umbonatus Berg, Hemip. Argentina, p. 11.

1880 Cyrtomenus mirabilis Distant, Biol. Centr.-Amer., Rhynch., 1:3 (part).

1881 Cyrtomenus mirabilis Signoret, Ann. Soc. Ent. France, (6) 1:199, pl. 6, fig. 19 (part).

1893 Cyrtomenus mirabilis Lethierry and Severin, Gen. Catal. Hemip., 1:62 (part).

DIAGNOSIS: The absence of a partial, postmedian row of setigerous punctures on lateral third of sternites IV to VI and the large ocelli which are removed from the eyes by a space distinctly less than a transverse ocellar width will separate mirabilis from the other members of the subgenus.

DESCRIPTION: MALE:- HEAD: length more than half width, 1.55 (1.40-1.69): 2.28 (2.12-2.40); interocular width, 1.36 (1.30-1.43); anterior margin fully semicircular, broadly reflexed juga surpassing clypeus and convergent or contiguous in front ot it; surface polished, with numerous strong, radiating rugae and scattered minute punctures; ocelli very large, separated from eye by space distinctly less than transverse ocellar width; jugum ventrally

shining, in large part finely punctulate; maxillary plate alutaceous, with scattered, vague punctures; antennals, I, 0.43 (0.30-0.49): II, 0.30 (0.36-0.34): III, 0.54 (0.52-0.56): IV, 0.52 (0.50-0.56): V, 0.52 (0.50-0.56); bucculae less than half as high as labial II; labium reaching bases of posterior coxae, segments, I, 0.94 (0.91-1.00): II, 1.29 (1.26-1.33): III, 1.16 (1.10-1.24): IV, 1.05 (0.97-1.11). PRONOTUM: length more than half width, 3.09 (2.96-3.40): 5.13 (4.67-5.42); lateral margin straight or slightly concave on basal two-thirds, with eight to eighteen submarginal setigerous punctures; transverse impression moderate, usually obsolete medially, marked by irregular, medially interrupted row of coarse punctures; anterior lobe with broad, shallow, subapical impression, punctation restricted to broad, subapical band and irregular lateral patch of few to many punctures; posterior lobe with few widely scattered punctures, especially in middle third. SCUTELLUM: length subequal to width, 3.30 (2.92-3.61): 3.30 (2.91-3.60); disc polished, with widely scattered, coarse, sunken punctures. HEMELYTRON: clavus and corium polished; clavus with one submedian row of punctures; mesocorium rather uniformly and closely punctate except in smooth space along radial vein and in two rows of close-set punctures paralleling claval suture; exocorium irregularly and less densely punctate than mesocorium; costa with four to eight setigerous punctures; membrane distinctly surpassing apex of abdomen. PROPLEURON: alutaceous, with few punctures in depression. MESOPLEURON: lateral area shining, impunctate with few obsolete rugulae. METAPLEURON: lateral margin of evaporatorium straight or slightly concave; lateral area polished, impunctate. LEGS: anterior tibia dorsally with seven or eight stout, flattened, blunt spines arising from blackened elevations; posterior tibia moderately widened apically,

greatest diameter less than that of anterior tibia. STERNITES: polished, without postmedian rows of setigerous punctures at lateral third of segments III to VI. TERMINALIA: genital capsule polished, with scattered minute punctures more abundant laterally, apical margin nearly straight or faintly sinuate laterally; gonostylus as illustrated (Fig. 246). LENGTH of body, 8.85 (8.38-9.37).

FEMALE:- similar to male, subapical impression of pronotum less extensive. HEAD: length: width:: 1.47 (1.43-1.56): 2.31 (2.25-2.41); interocular width, 1.41 (1.36-1.44); antennals, I, 0.43 (0.40-0.46): II, 0.27 (0.25-0.31): III, 0.53 (0.44-0.60); IV, 0.50 (0.47-0.56): V, 0.53 (0.50-0.60); labials, I, 0.92 (0.86-1.06): II, 1.27 (1.23-1.36): III, 1.16 (1.10-1.23): IV, 1.03 (0.94-1.11). PRONOTUM: length: width:: 3.04 (2.85-3.42): 4.99 (4.82-5.36). SCUTELLUM: length: width:: 3.07 (2.40-3.28)

TYPE DATA: The type of mirabilis Perty, which the author has not yet located, was said to have come from "Provincia Piauhiensis," Brazil. Berg's (loc. cit.) types of Macroscytus umbonatus were reported as having come from the Argentine localities of "Catamarca et Tucuman." These types, as is true of most of Berg's types, are apparently lost. Dr. N. A. Kormilev informed the author in correspondence that he was unable to locate these types in any Argentine museums that he had visited.

DISTRIBUTION: The material studied was from Brazil west and south to Peru, Paraguay and Argentina on the South American continent.

DISCUSSION: Although the close resemblance between this form and the common one of the southern United States led most authors to consider them as one, there is sufficient difference to warrant separating them. In fact,

the present study also separates out a geographically intermediate form, crassus Walker. The form of the southern United States properly takes the name ciliatus of Palisot Beauvois, as explained under that species treatment in the present paper. The synonymy of Berg's Macroscytus umbonatus was pointed out by Signoret (1881a); and judging from Berg's (1883) acquiescing comments, the type specimen was simply a deformed specimen of this.

For discussion of this species in relation to the others of the subgenus, the interested reader is invited to read the comments in the introduction to this subgenus and those under the name C. ciliatus.

SPECIMENS STUDIED: 12 males, 13 females. BRAZIL: Campinas, Kolvene, Nova Teutonia, Porto Alegre, Taperina; October, November. PERU: Chauchamayo. PARAGUAY: Asuncion, Colonia Nuevo Italia, Horqueta; September to December. ARGENTINA: Tucuman; December.

Genus Tominotus Mulsant and Rey

1866 Tominotus Mulsant and Rey, Ann. Soc. Linn. Lyon, (n.s.) 13:319.

1876 Trichocoris Uhler, Bull. United States Geol. Geog. Surv. Terr., 1(5):11.

1922 Psectrocephalus Van Duzee, Ent. News, 33:270.

Aethus auctorum, nec Dallas (1851:110).

DIAGNOSIS: This genus is best diagnosed by the lack of differentiated terminal part of the osteolar canal, the terete hind tibiae which have all spines similarly developed and by the complete, submarginal row of coarse, close-set setigerous punctures on the head.

DESCRIPTION: size small to large (4-12), oval, ovate or subparallel; dorsum much less convex than venter. HEAD: length usually more than half width, flattened to somewhat convex above; juga carinate dorsally on margin,

as long as or longer than and convergent in front of clypeus; juga with a submarginal row of coarse, close-set punctures giving rise to long cilia and usually also to short, erect, stout pegs; eyes well developed, slightly to strongly projecting; ocelli absent or well-developed, when present located on or behind a line connecting hind margins of eyes and separated from eyes by a space equal to or greater than an ocellar width; antennae five-segmented, I shortest, other variable in proportion; bucculae low to very high, reaching nearly or quite to base of head; labium reaching from middle of mesosternum to middle of metasternum, labial II longest, compressed but without a foliaceous lobe, IV shortest. PRONOTUM: width about twice length; anterior margin moderately to strongly emarginate, without a paralleling submarginal groove; lateral margins carinate, narrowed on apical third or more, basal part straight or incurved, some males with slight to strong constriction submedially; lateral submarginal setigerous punctures variable in number and arrangement; posterior margin broadly but shallowly convex; transverse impression distinct to absent, usually marked by a row or band of distinct punctures. SCUTELLUM: wider or narrower than long, triangular, apex broad and rounded (Fig. 80) or distinctly narrowed (Fig. 79); disc impunctate, weakly punctate or with numerous distinct punctures. HEMELYTRON: corial areas well defined; costa with one to many setigerous punctures; membranal suture straight or weakly bisinuate, curved anteriorly or posteriorly laterally; membrane distinctly less than one-third of hemelytral length, approaching, reaching or surpassing apex of abdomen. PROPLEURON: weakly to distinctly convex anterior to depression, usually with some punctures; prosternal carinae prominent, usually rather sharp; anterior margin slightly lobulate either side or middle. MESOPLEURON:

weakly concave; evaporatorium extensive to very restricted and interrupted by mesally projecting spur of lateral polished area (Fig. 111); latter usually impunctate; mesosternum swollen, carinate on basal half or more and with numerous long hairs. METAPLEURON: (Fig. 111) flattened; evaporatorium occupying mesal half or more of segment, vaguely or sharply defined from lateral area; latter with or without punctures; osteolar peritreme without a differentiated terminal lobe, sharply delimited apically or continued obliquely to anterior margin of segment; osteole opening posteriorly at emargination of peritreme, a subapical spur usually also present. LEGS: short to moderately long; anterior tibia (Fig. 117) distinctly compressed, dorsal margin with six to ten stout spines, not surpassing tarsal insertion; middle and posterior tibiae (Fig. 140) slender, terete, equally spined on all margins; posterior tibia as long as or longer than abdomen; tarsal II shortest, I equal to or shorter than III. VENTER: strongly convex, shining, with or without setigerous punctures; posterior margin of each segment finely to distinctly crenulate.

No nymphal material was available for study.

GENOTYPE: Cydnus (Tominotus) signoreti Mulsant and Rey (1866:319), monobasic; of Trichocoris, Trichocoris conformis Uhler (1876:277), monobasic; of Psectrocephalus, Psectrocephalus caecus Van Duzee (1922:271), original designation and monobasic.

DISTRIBUTION: This genus occupies a wide range from North Carolina, Tennessee, Missouri, Arizona and California south through Central America and the Antilles to Argentina and Chili.

DISCUSSION: The separation of this genus from Dallasia marks a rather weak area in the present attempt to redefine the cydnid genera that occur in

the Western Hemisphere. These two groups are both relatively unspecialized when compared to allied forms and so present no really strong features for separation. The complete, submarginal row of coarse punctures does set off a group of closely allied species, but leaves the residuum containing species in which the submarginal row of punctures varies from absent to well developed and reaching almost to apex of jugum, this character being simply one extreme of an almost continuous variation.

Tominotus Mulsant and Rey, based on a species originally described from France, appears to be the correct name for this genus as it is the oldest included generic name. A rather unusual set of circumstances beclouds the soundness of this application, but a statement of events leading to this decision should indicate the reasons for making it. Tominotus was described in 1866 by Mulsant and Rey as a subgenus of Cydnus and contained the single, newly described species signoreti, that species being the genotype by the monobasic condition of the original proposal. The specimen on which it was based was reported as having come from the collection of Signoret and its locality of capture was given as "Montpellier," in France. The species was thus carried as an European form. However, Signoret (1881b) reported that he was unable to separate signoreti from Berg's (1879) Argentine species constrictus; he further stated that Mulsant and Rey's French locality for their species had been due to a misinterpretation of the abbreviated locality "Mont." on his specimen label. He stated that this abbreviation stood for "Montevideo" and not "Montpellier." In view of Signoret's explanation (and in spite of the fact that he had given both names valid standing in his "Revision") and the fact that Mulsant and Rey's description leaves no doubt about the identity of their species with that

of Berg's, one is forced to consider Berg's name as a synonym, as has already been done by Berg (1891:171). Tominotus thus is available and must be considered in the study of nomenclature for forms of the Western World.

But why replace the older, better-known name Aethus of Dallas with Tominotus? In redefining the genera the start must be made from the genotype. The genotype of Aethus Dallas (1851) is Cydnus indicus Fabricius, subsequently designated by Van Duzee (1914:378). It possesses a differentiated terminal osteolar process, the shape of which (Fig. 99) is unlike that found in any species of cydnids found in the Western Hemisphere. The terminal process in Aethus indicus is almost semicircular with the convexity cephalad, a strong emargination in the transverse posterior margin and the surface in part polished. As thus restricted, Aethus appears to have a limited distribution chiefly in Asia; but as only limited extra-limital material was available for study its range may be more extensive.

Thus, our American forms, none of which are congeneric with Aethus indicus, must take new generic names. After transferring certain other species, those which belonged to the Aethus of American authors (not Dallas) on the basis of a complete submarginal row of setigerous punctures must take the name Tominotus Mulsant and Rey (1866) because that name antedates all other included generic proposals, Trichocoris Uhler (1877) and Psectrocephalus Van Duzee (1922), by several years. The other New World species that were either originally described in or commonly included in Aethus may now be found in Dallasiellus, Ectinopus, Homaloporus, Onalips, Pangaeus or Rhytidoporus.

In Tominotus the vestiture arising from the submarginal row of

setigerous punctures on the head may be uniformly hair-like, or may consist of a row of peg-like setae with a few hair-like ones interspersed. A caution for interpreting this character already given in the Introduction to this study may be profitably repeated here -- the burrowing habit often results in the breaking of the hair-like setae near their bases resulting in what appears to be a row of the peg-like setae. Although this vestiture character has not been used as a primary key character in the present study, it is mentioned in the descriptions of each species and offers a usable recognition feature for certain groups of the included species. But the caution must be heeded in interpreting the descriptions and especially in describing new forms.

Key to the Known Species of Tominotus

1. Mesopleural evaporatorium interrupted posteriorly by a transverse, marginal or submarginal polished band (Fig. 111). 2

   Mesopleural evaporatorium not interrupted posteriorly by polished band. 11

2. Scutellar apex broad (Fig. 80), half or more than half as wide as membranal suture. 3

   Scutellar apex narrowed (Fig. 79), distinctly less than half as wide as membranal suture. 9

3. Pronotum with lateral submarginal setigerous punctures arranged in single, impressed row (Fig. 68); costa with not more than ten setigerous punctures. 4

   Pronotum with lateral submarginal setigerous punctures not confined to a single, submarginal row, but forming a wider, submarginal stripe, especially anteriorly (Fig. 69); costa

with fifteen or more setigerous punctures. 8

4. Pronotum laterally with many distinct, moderately coarse punctures on both lobes. 5

Pronotum laterally with few or no distinct punctures laterally (sometimes with minute punctures). 7

5. Costa creamy-white, contrasting strongly with dark brown corium. . . . . .albicostus n.sp. p. 322

Costa concolorous with remainder of corium. 6

6. Tibiae yellowed, in contrast to reddish-brown femora; size larger, length of body, 6.9-8; lateral pronotal margins of males not constricted. . . . . brevis (Sign.) p. 328

Tibiae concolorous with femora; size smaller, length of body, 5-5.2; lateral pronotal margins strongly constricted near middle (Fig. 6). . . . . signoreti (Muls. & Rey) p. 357

7. Membranal suture virtually straight (Fig. 82); scutellum with few widely scattered punctures; larger, length of body, 8.6. . . . . .impunctico1lis (Dist.) p. 349

Membranal suture distinctly bisinuate (Fig. 81); scutellum with many crowded punctures; smaller, length of body, 5.5. . . . . .blanchardi (Sign.) p. 324

8. Abdomen polished, impunctate except in spiracular area; larger, length of body, 8.5-10.0. . . . . hogenhoferi (Sign.) p. 346

Abdomen and dorsal surface, except membranae, with long, golden setae similar to those along lateral margins; smaller, length of body, 5.0-6.8 . . . . . conformis (Uhl.) p. 340

9. Corium alutaceous; costa with two setigerous punctures. . . . . .

. . . . . .*brevirostris* n.sp. p. 326

Corium polished; costa with five to ten setigerous punctures. . . . 10

10. Size smaller, length of body 5.1-7.3; labium surpassing middle coxae. . . . . .*communis* (Uhl.) p. 334

Size larger, length of body, 9.1-10.8; labium not reaching middle coxae . . . . . *curvipes* (Dall.) p. 343

11. Scutellar apex broad (Fig. 80), half or more than half as wide as membranal suture; general color yellowish, punctures and maculae on anterior pronotal lobe fuscous. *nigropunctatus* (Berg) p.355

Scutellar apex narrowed (Fig. 79), distinctly less than half as wide as membranal suture; general color uniformly piecous to black. 12

12. Ocelli present, distinct; costa with not more than five setigerous punctures. 13

Ocelli absent; costa with ten or more setigerous punctures. . . . . *caecus* (VanD.) p. 332

13. Costa with one setigerous puncture; male with apex of genital capsule distinctly V-emarginate. . . . . *unisetosus* n.sp. p. 363

Costa with two to four setigerous punctures; male with apex of genital capsule not V-emarginate 14

14. Clypeus with two, subapical setigerous punctures; size smaller, length of body, 3.7-4.5. . . . . *insularis* (Westw.) p. 351

Clypeus without subapical setigerous punctures; size larger, length of body, 4.8-5.5. . . . . *subtilius* (Sign.) p. 360

Tominotus albicostus NEW SPECIES

DIAGNOSIS: The creamy white costa plus the unicolorous pronotum will separate this species from all other Cydnidae known to occur in the Western Hemisphere.

DESCRIPTION: (described from a single female specimen) FEMALE:- broadly oval. HEAD: length about two-thirds of width, 1.26:1.80; interocular width, 1.28; juga rounded, forming a semicircle, as long as clypeus, latter with two subapical setigerous punctures; jugum with a complete, submarginal, depressed row of coarse setigerous punctures giving rise to long hair-like setae and stout pegs; surface slightly convex, weakly rugose radially, punctate only toward margins; ocelli small, separated from eyes by space about four times an ocellar width; jugum and maxillary plate (except posteriorly) impunctate; antennals I, 0.36: II, 0.33: III, 0.35: IV, 0.40: V, 0.46; buccular lower than labial II; labium reaching between middle coxae, segments I, 0.60: II, 0.76: III, 0.70: IV, 0.46. PRONOTUM: length less than half width, 1.99: 4.26; anterior margin broadly and deeply emarginate; lateral margins entire, not emarginate, with about thirty setigerous punctures in a single, submarginal row; transverse impression slightly behind midlength, obsolete, marked by an irregular band of slightly coarser punctures; anterior lobe impunctate discally, a few distinct punctures anteriorly and a wide band of them laterally; surface finely alutaceous except on impunctate calli; posterior lobe weakly and finely alutaceous, with fine, irregular punctures over most of width. SCUTELLUM: wider than long, 2.87: 2.36; finely alutaceous; with numerous irregular, crowded punctures, except basally. HEMELYTRON: clavus and corium alutaceous; clavus with irregular, partly confluent punctures; corium with numerous

punctures, these more abundant in two rows paralleling claval suture and on exocorium; costa with twelve setigerous punctures; membranal suture bisinuate, lateral angle slightly acute; membrane longer than basal width. PROPLEURON: more or less alutaceous, punctured anteriorly, in depression and in latero-posterior angle. MESOPLEURON: evaporatorium separated from posterior margin of segment for nearly full width; lateral area with few distinct punctures; posterior margin entire. METAPLEURON: evaporatorium occupying mesal half, prolonged laterally along anterior margin; peritreme extended about one-third across segment, evanescent apically; lateral area alutaceous and punctate on mesal two-thirds. LEGS: moderately long; posterior tibia straight. STERNITES: alutaceous, finely punctate, with few irregular rugae laterally. LENGTH of body, 6.29.

TYPE DATA: HOLOTYPE female is a specimen in the collection of the Naturhistorisches Museum in Vienna, Austria, labelled, "Fiebrig, Paraguay, S. Bernardino."

DISTRIBUTION: The only locality record available was that on the type female from Paraguay.

DISCUSSION: As indicated in the key, this species is most closely allied to brevis Signoret and signoreti Mulsant and Rey. In addition to the key characters it agrees with these in general habitus, being broadly oval, with a semicircular head and having the dorsum and venter alutaceous. Its large size (6.29) and creamy-white costa separate it from signoreti, while the pale costa and the greater number (about 30:15) of submarginal setigerous punctures laterally on the pronotum will enable one to recognize it from brevis.

Tominotus blanchardi (Signoret) NEW COMBINATION

1864 Aethus blanchardi Signoret, Ann. Soc. Ent. France, 1864:454.

1867 Aethus blanchardi Walker, Catal. Hemip. Brit. Mus., 1:152.

1876 Aethus blanchardi Stal, Svenska Vet.-Ak. Handl., 14(4):27.

1882 Cydmus ? blanchardi Signoret, Ann. Ent. Soc. France, (6) 2:154, pl. 6, fig. 91.

1893 Cydnus blanchardi Lethierry and Severin, Gen. Catal. Hemip., 1:65.

DIAGNOSIS: Among those members of the genus whose body length is less than 6 mm. the broad scutellar apex and lack of distinct punctures towards sides of pronotal lobes will identify this species.

DESCRIPTION: (Based on the lone available specimen which lacked antennae, legs and abdomen, consequently sex is unknown) oval. HEAD: length two-thirds of width, 0.90: 1.36; interocular width, 0.94; surface shining, juga with few obsolete, radiating rugae and numerous very fine punctures; ocelli small, separated from eye by twice an ocellar width; jugum ventrally and maxillary plate impunctate, latter finely alutaceous; antennae missing; bucculae lower than height of labial II; labials, I, 0.40: II, 0.61: III, 0.47: IV, 0.34. PRONOTUM: length half of width, 1.40:2.81; anterior margin broadly and moderately emarginate; side margins strongly converging from base with a single submarginal row of about twenty-five setigerous punctures; transverse groove slightly behind midlength, very feeble; anterior lobe shining, with fine but distinct punctures behind anterior emargination and a few obsolete punctures laterally; posterior lobe with irregularly scattered moderate to minute punctures. SCUTELLUM: little longer than wide, 1.85: 1.75; surface shining, disk with numerous rather close-set punctures coarser than those of pronotum, apex with fine punctures; apex

broadly angled, more than half as wide as membranal suture. HEMELYTRON: corial areas well-defined, alutaceous; exocorium more closely punctured than disc, latter with a single row of close-set punctures paralleling claval suture; clavus alutaceous, with two longitudinal rows of punctures; costa with ten or twelve setigerous punctures; membranal suture strongly bisinuate (Fig. 81), lateral angle acute; membrane longer than basal width. PROPLEURON: finely alutaceous, impunctate; prosternal carinae thick, prominent, abruptly and acutely terminated ventrally, area between depressed. MESOPLEURON: evaporatorium triangular, extending about three-fourths across segment, and separated from posterior margin of segment nearly to base by polished area. METAPLEURON: evaporatorium reaching three-fourths across segment, lateral two-fifths more shining; peritreme abruptly terminated before middle of segment. LEGS: missing. STERNITES: abdomen missing. TERMINALIA: missing. LENGTH of body, about 5.5.

TYPE DATA: As yet, the author has been unable to locate Signoret's type which had been reported as coming from "Chili."

DISTRIBUTION: The single specimen studied agreed with Signoret's type specimen in having come from Chile.

DISCUSSION: The lone specimen studied was an old, very incomplete specimen lacking antennae, legs and abdomen. It bore an unusual, double-faced, blue-bordered label with a determination of "Aethus blanchardi" in what appeared to be Signoret's handwriting, and a penciled note, "Chili." This specimen was from the United States National Museum and may have been a part of the Uhler collection, although it was not so labelled.

In illustrating this species in his "Revision," Signoret (1882) depicted the peritreme as terminating in an auricular lobe. The specimen at

hand showed the peritreme ending abruptly, but not in the loop or ear-shape structure implied by Signoret.

SPECIMENS STUDIED: 1 broken specimen of unknown sex. CHILE: "Chili."

Tominotus brevirostris NEW SPECIES

DIAGNOSIS: The large size (9.5-10.2) plus the strongly alutaceous coria will differentiate this species from all others in the genus.

DESCRIPTION: MALE:- (one specimen) elongate oval. HEAD: length more than two-thirds width, 1.75: 2.34; interocular width, 1.52; outline semi-circular, juga narrowing clypeus or contiguous beyond it; clypeus without subapical punctures; juga roughened by many crowded, distinct, radiating rugae and a few moderate punctures; submarginal row of punctures giving rise to long cilia and no pegs (all specimens badly abraided); vertex impunctate; ocelli separated from eyes by almost twice an ocellar width; juga ventrally and maxillary plate impunctate; antennals, I, 0.53: II, 0.70: III, 0.70: IV, 0.93: V, 1.00; bucculae as high as labial II almost to abrupt posterior end; labium reaching to middle of mesosternum, segments, I, 0.76: II, 1.10: III, 0.83: IV, 0.56. PRONOTUM: length slightly more than half width, 2.85: 5.42; anterior margin deeply, almost semicircularly emarginate; side margins entire, not constricted opposite ends of transverse groove, with a single, sub-marginal row of six setigerous punctures; transverse groove absent, marked by irregular band of small, distinct punctures which laterally extends anteriorly and posteriorly on otherwise impunctate pronotal lobes. SCUTELLUM: length and width subequal, 3.42: 3.49; triangular, apex narrowed; disc very faintly alutaceous, with numerous irregularly scattered moderate punctures which get closer and finer toward apex. HEMELYTRON: corial areas

well defined, strongly alutaceous; mesocorial area with distinct punctures only in basal part and in one complete and second incomplete rows paralleling claval suture, apically with widely separated, very fine punctures; exocorial area with distinct punctures only at base; radial vein and costa with numerous fine punctures; costa also with two or three setigerous punctures; clavus alutaceous like corium, with two partial rows of punctures; membranal suture weakly bisinuate, lateral angle slightly projecting; membrane distinctly longer than basal width, distinctly surpassing apex of abdomen. PROPLEURON: with few distinct punctures ventrally in depression. MESOPLEURON: evaporatorium extending into postero-lateral angle, interrupted near posterior margin by weak polished band; posterior margin of segment moderately coarsely crenulate. METAPLEURON: evaporatorium occupying about mesal two-thirds of segment, lateral margin well defined, strongly concave; peritreme reaching about half way across segment, posterior subapical emargination with a distinct, flattened process. VENTER: alutaceous, almost smooth and with numerous minute punctures along midline, vaguely roughened laterally. TERMINALIA: apical margin of genital segment entire and not flared marginally; gonostyli as illustrated (Fig. 247). LENGTH of body: 10.00.

FEMALE:- very similar to male. HEAD: length: width:: 1.71 (1.56-1.95): 2.34 (2.25-2.42); interocular width, 1.56 (1.49-1.66); antennals, I, 0.54 (0.50-0.60): II, 0.78 (0.76-0.83): III, 0.64 (0.56-0.70): IV, 0.94 (0.90-1.00): V, 1.04 (1.00-1.16); labials, I, 0.81 (0.76-0.90): II, 1.06 (1.00-1.12): III, 0.89 (0.86-0.93): IV, 0.57 (0.55-0.61). PRONOTUM: length: width:: 2.88 (2.78-3.00): 5.45 (5.25-5.67). SCUTELLUM: length: width:: 3.51 (3.36-3.71): 3.42 (3.28-3.57). LENGTH of body, 9.91 (9.56-10.14).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both in the collection of the United States National Museum and labelled, "Mexico, 10 km., N. E. of Tasco, Gro., 4-IV-1943, W. F. Foshag." PARATYPES: same data as holo- and allotype, 11 f (USNM, RCF). Tejupilco, Mex., Temescaltepec, VI-30-33, H. E. Hinton, R. L. Usinger Collectors, 2 f (RLU). Mexico: Michoacan, 12 mi. s. Tzitzio on Huetamo rd., 19° 21' N, 100° 50' W, VII, 9, 1947, 87, T. H. Hubbell, 1050 m, 2 f (RFH).

DISTRIBUTION: All specimens examined were from the states of Guerrero, Mexico and Michoacan in central Mexico.

DISCUSSION: The trivial name, brevirostris, calls attention to the fact that the labium reaches only to the middle of the mesosternum and not to the middle coxae or farther as occurs in most species of the family.

The large size, and generally alutaceous dorsal and ventral surfaces suggest that this species might be closely related to the members of the genus Ectinopus, but the lack of a differentiated terminal process on the osteolar peritreme, the presence of three primary setigerous punctures on a jugum and the complete row of submarginal setigerous punctures on the jugum all combine to prevent assignment of it to that genus.

Tominotus brevis (Signoret) NEW COMBINATION

1882 Aethus brevis Signoret, Ann. Soc. Ent. France, (6) 2:426, pl. 11, fig. 55.

1893 Cydnus brevis Lethierry and Severin, Gen. Catal. Hemip., 1:65.

1926 Aethus neotropicus Jensen-Haarup, Ent. Medd., 16:49.

DIAGNOSIS: The decidedly yellowed tibiae (especially the hind pair) which contrast with the reddish-brown femora will readily separate this species from others included in the genus.

DESCRIPTION: MALE:- (based on two specimens) broadly oval. HEAD: length nearly two-thirds of width, 1.29 (1.23-1.36): 1.90 (1.86-2.02); interocular width, 1.23 (1.20-1.30); juga rounded, forming a semicircle, as long as clypeus, latter with two subapical setigerous punctures; juga with a complete, submarginal, depressed row of coarse setigerous punctures giving rise to stout pegs with a few interspersed cilia; surface slightly convex, with weak radiating rugae and scattered minute punctures; ocelli small, separated from eyes by more than three times an ocellar width; jugum ventrally and maxillary plate (except posteriorly) impunctate; antennals, I, 0.38 (0.36-0.43): II, 0.45 (0.40-0.51): III, 0.48 (0.43-0.51): IV, 0.62 (0.58-0.66): V, 0.64 (0.60-0.66); bucculae lower than height of labial II; labium slightly surpassing middle coxae, segments, I, 0.88 (0.83-0.95): II, 1.24 (1.13-1.33): III, 0.97 (0.96-1.03): IV, 0.61 (0.53-0.68). PRONOTUM: width more than twice length, 4.52 (3.97-4.66): 2.10 (1.92-2.28); anterior margin broadly and deeply emarginate; lateral margins entire, not emarginate, with about 15-20 setigerous punctures in a single, submarginal row (Fig. 68); transverse impression slightly behind midlength, marked by a more or less regular row of moderately coarse punctures; anterior lobe with numerous similar punctures laterally and a number of finer ones subapically, surface very finely alutaceous except on impunctate calli; posterior lobe very weakly alutaceous, with punctures more numerous laterally than discally. SCUTELLUM: length and width subequal, 2.61 (2.50-2.73): 2.66 (2.47-2.88); surface with weak, transverse wrinkles and numerous fine, close-set, longitudinal striae between distinct punctures which become finer and closer toward apex; latter more than half as wide as membranal suture. HEMELYTRA: corial areas well defined, strongly but finely alutaceous and

distinctly and rather uniformly punctured with two regular rows of punctures paralleling claval suture; clavus alutaceous, with two regular rows of distinct punctures; membranal suture obtusely angularly convex, rectangular at outer angle; membrane slightly surpassing apex of abdomen, a little longer than basal width. PROPLEURON: very weakly alutaceous, punctured at antero-ventral angle and in depression; prosternal carinae prominent, thick, calloused, abruptly and rectangularly terminated posteriorly. MESOPLEURON: evaporatorium separated from posterior margin for nearly full length by polished band; lateral area with few distinct punctures; posterior margin weakly crenulate. METAPLEURON: evaporatorium occupying about half of segment; lateral area immediately adjacent to it with distinct rugae and punctures; peritreme extending about one-third across segment, becoming evanescent apically. STERNITES: smooth, sometimes visibly alutaceous laterally. LEGS: moderately long, posterior tibia virtually straight. TERMINALIA: genital capsule shining, obsoletely rugulose, impunctate, apical margin virtually straight, gonostylus as illustrated (Fig. 248). LENGTH of body, 6.97 (6.90-7.05).

FEMALE:- very similar to male except that antennal II is equal in length to III instead of being shorter as in the male, and the scutellum is distinctly wider than long instead of having the length and width subequal. HEAD: length: width:: 1.34 (1.30-1.38): 2.05 (1.98-2.08); interocular width, 1.33 (1.27-1.37); antennals, I, 0.40 (0.40-0.42): II, 0.49 (0.46-0.53): III, 0.47 (0.46-0.48): IV, 0.61 (0.60-0.66): V, 0.63 (0.60-0.66); labials I, 1.02 (1.00-1.06): II, 1.26 (1.13-1.33): III, 0.98 (0.90-1.06): IV, 0.64 (0.60-0.70). PRONOTUM: width: length:: 4.54 (4.46-4.69): 2.18 (2.02-2.37). SCUTELLUM: width: length:: 3.05 (2.93-3.13): 2.86 (2.75-3.06). LENGTH of

body, 7.60 (7.20-7.95).

COLOR: above piceous with metallic reflections, broad margin of head, side margins of pronotum and all of corium usually paler; membrane milky white, marks along veins and between them fuscous; ventrally slightly paler, acetabulae and femora reddish-brown; antennae, labium, prosternal carinae, basal third or more (all of posterior) tibia and tarsi distinctly yellow.

TYPE DATA: The type is a female specimen in the Naturhistorisches Museum in Vienna bearing a red type label and a locality label "Brasil." This specimen was made available for study through the kindness of Dr. M. Beier of that institution. In the original description two localities were cited, "Bresil" and "Nouvelle Grenade."

DISTRIBUTION: Specimens studied had come from Venezuela and Colombia in northern South America.

DISCUSSION: Little information is available on this well-marked form, but for some comments on its close relationship to other species see the discussion given under *Tominotus albicostus* new species.

SPECIMENS STUDIED: 7 males, 6 females. VENEZUELA: Iboa, Yaracuy, Hittier coll., 1m (USNM). COLOMBIA: Bogota, VII-20, 1927, M. H. Nicefero, 1f (JCL). Bonda, June, Acc. No. 1999, 3m (Carn, RCF). Rio Frio, Magd., 13-V-1927, G. Salt, 1f (USNM). Santa Marta, XII-26-10, Geo. M. Green Collection, 1m (USNM). Santa Marta Mts., Mamatoco, sea level, VII-22, 1920, F. M. Gaige, 1m, 1f (RFH). Santa Marta Mts., Valle del Tamacal, IX-22, 1920, F. M. Gaige, 1m, 1f (RFH). Villa Vieja, 11-IV-45, 1f (CalAc). BRAZIL: "Brasil" (Vienna) - type female.

Tominotus caecus (VanDuzee) NEW COMBINATION

1922 Psectrocephalus caecus VanDuzee, Ent. News, 33:270.

1939 Psectrocephalus caecus Torre Bueno, Ent. Amer., 19:182.

DIAGNOSIS: This is the only species in the genus that is without ocelli. All the others have the ocelli moderately to strongly developed and conspicuous.

DESCRIPTION: (this description is based on two males and one female) MALE:- elongate oval. HEAD: length more than two-thirds of width, 0.98 (0.93-1.03): 1.38 (1.30-1.46); interocular width, 0.99 (0.93-1.06); anterior outline broadly semicircular, eyes projecting by less than one-third of width; juga surpassing and nearly contiguous beyond apex of clypeus, latter without subapical setigerous punctures; juga with sharp margins distinctly reflexed, submargin with distinct pegs and a few long cilia, surface shining and with short radiating rugae and punctures; vertex with few or no punctures; jugum ventrally and maxillary plate (except posteriorly) impunctate; antennals, I, 0.28 (0.26-0.30): II, 0.28 (0.26-0.30): III, 0.31 (0.30-0.33): IV, 0.30 (0.30-??): V, 0.33 (0.33-??); bucculae slightly lower than height of labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.58 (0.56-0.60): II, 0.69 (0.63-0.76): III, 0.51 (0.43-0.60): IV, 0.36 (0.34-0.38). PRONOTUM: width slightly more than twice length, 2.92 (2.79-3.06): 1.39 (1.36-1.43); anterior margin moderately deeply and almost simply emarginate; side margins subparallel on basal fourth, thence gently narrowed to broadly rounded anterior angles, not emarginate opposite ends of transverse groove; lateral submarginal row of some thirty setigerous punctures giving rise to long, reddish cilia; transverse groove broad, very shallow, situated near basal fourth; anterior lobe

with broad lateral area and narrower anterior area with distinct punctures, calli and median line impunctate; posterior lobe and transverse groove with numerous scattered, distinct punctures across width. SCUTELLUM: distinctly longer than wide, 2.15 (2.02-2.28): 1.85 (1.75-1.95); triangular, apex narrowed, disk with numerous distinct punctures which are missing from narrow basal area and are more numerous at apex. HEMELYTRON: corial areas weakly defined; corium and clavus with numerous distinct punctures, these more dense on exocorium and in single impressed row paralleling claval suture; membranal suture bisinuate and slightly acute laterally; membrane somewhat longer than wide, just attaining apex of abdomen. PROPLEURON: polished, impunctate, prosternal carinae low, rather sharp. MESOPLEURON: evaporatorium extending uninterrupted into postero-lateral angle of segment. METAPLEURON: evaporatorium occupying mesal two-thirds of segment, lateral margin concave; lateral area impunctate; peritreme reaching almost to middle of segment, apex fused with cuticle. VENTER: shining, impunctate, with a few weak, usually short rugae laterally. TERMINALIA: subgenital plate not reflexed marginally, apex feebly convex with the faintest trace of a median emargination; gonostyli as illustrated (Fig. 249). LENGTH of body, 5.55 (5.24-5.87).

FEMALE:- generally similar to male; measurements: HEAD: length: width:: 0.98: 1.40; interocular width, 0.96; antennals, I, 0.30: II, 0.33: III, 0.30: IV, 0.36: V, ??; labial segments, I, 0.55: II, 0.70: III, 0.50: IV, 0.36. PRONOTUM: width: length:: 3.00: 1.43. SCUTELLUM: length: width:: 2.28: 2.06. LENGTH of body, 5.68.

TYPE DATA: "Holotype male, No. 926, and allotype, female, No. 927, Museum California Academy of Sciences," - VanDuzee (1922:271). Both types

were said to have been taken as follows: "Pasadena, California, October 12, 1916, one pair taken among ants under a stone."

DISTRIBUTION: Specimens studied were from California and "S. W. Mex."

DISCUSSION: Further comments given by VanDuzee (loc. cit.) with the original description carry the information that the three paratypes had also been taken "under stones," and that he believed that "This species undoubtedly is an inhabitant of ants' nests and may be common in such situations."

SPECIMENS STUDIED: UNITED STATES: California: Greenhorn Mt., Kern Co., VI-17, 1930, 1m (KU). Ls. Angls, Coquillett, 1m (USNM). MEXICO: "S. W. Mex.," 1f (USNM).

Tominotus communis (Uhler) NEW COMBINATION

1877 Aethus communis Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:379.

1882 Aethus communis Signoret, Ann. Soc. Ent. France, (6) 2:35, pl. 2, fig. 76.

1882 Aethus politus Signoret, Ann. Soc. Ent. France, (6) 2:36, pl. 2, fig. 77.

1886 Aethus communis Uhler, Checklist Hemip. N. Am., p. 3.

1886 Aethus politus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus communis Lethierry and Severin, Gen. Catal. Hemip., 1:65.

1893 Cydnus politus Lethierry and Severin, Gen. Catal. Hemip., 1:67.

1910 Cydnus communis Banks, Catal. Nearc. Hemip., p. 99.

1910 Cydnus politus Banks, Catal. Nearc. Hemip., p. 99.

1917 Aethus communis Van Duzee, Univ. California Pubs. Ent., 2:20.

1917 Aethus politus Van Duzee, Univ. California Pubs. Ent., 2:20.

1932 Aethus communis Barber and Bruner, Jour. Dept. Ag. Puerto Rico, 16:235.

1939 Aethus communis Torre Bueno, Ent. Amer., 19:179.

1939 Aethus politus Torre Bueno, Ent. Amer., 19:179.

DIAGNOSIS: The moderate size (5.14-7.22), narrowed scutellar apex and polished dorsum will separate this species from its congenors.

DESCRIPTION: MALE:- oval. HEAD: length more than half of width, 1.02 (0.93-1.10): 1.62 (1.43-1.75); interocular width, 1.04 (0.91-1.13); juga rounded, forming a semicircle or flattened semicircle (Figs. 54 and 55) (see DISCUSSION), as long as clypeus, latter with two subapical setigerous punctures; jugum with a complete, submarginal, depressed row of setigerous punctures giving rise to a row of stout pegs and several long cilia; surface slightly convex, sometimes depressed longitudinally just mesad of eyes, neither punctate nor rugose; ocelli well-developed, separated by eyes by a space slightly more than an ocellar width; jugum ventrally impunctate; maxillary plate impunctate except for several coarse, very close-set punctures posteriorly; antennals, I, 0.33 (0.30-0.36): II, 0.38 (0.30-0.46): III, 0.33 (0.30-0.38): IV, 0.41 (0.36-0.51): V, 0.50 (0.46-0.56); bucculae much lower than labial II, evanescent posteriorly; labium very slightly surpassing middle coxae, segments, I, 0.68 (0.60-0.72): II, 0.84 (0.73-0.99): III, 0.74 (0.66-0.80): IV, 0.57 (0.46-0.63). PRONOTUM: width slightly more or less than twice length, 3.34 (2.86-3.84): 1.67 (1.36-2.02). anterior margin broadly and moderately deeply emarginate; lateral margins faintly to very strongly constricted at midlength (Fig. 72) (see DISCUSSION), with submarginal row of some twenty setigerous punctures; transverse impression slightly postmedian, absent except laterally, usually marked by a medially interrupted row of distinct punctures; anterior lobe impunctate discally, laterally with numerous close-set, very fine punctures and occasionally several scattered coarser ones; posterior lobe impunctate or with fine punctures laterally. SCUTELLUM: usually little longer than

wide, 2.21 (1.91-2.60); 2.16 (1.82-2.47); surface polished, with few to several distinct punctures discally and numerous fine ones apically; apex narrowed, width less than half of membranal suture. HEMELYTRON: corial areas well defined; surface polished to vaguely alutaceous, variously punctured (see DISCUSSION) but more coarsely so basally and in two rows paralleling claval suture; clavus with coarser punctures arranged in longitudinal rows; costa with five to eight setigerous punctures; membranal suture nearly straight, slightly acute at lateral angle. PROPLEURON: smooth or faintly alutaceous, punctate only in depression. MESOPLEURON: evaporatorium reaching two-thirds across segment, separated from posterior margin by a polished band; lateral area somewhat rugose, impunctate. METAPLEURON: evaporatorium occupying mesal two-thirds or three-fourths of segment, polished area smooth, impunctate; peritreme extending about half way across segment, apex fusing with surrounding cuticle or more or less free due to forward curving of posterior margin, lateral polished area impunctate; sternites polished, impunctate. LEGS: moderately long, posterior femur with a subapical, midventral tubercle (see DISCUSSION); posterior tibiae distinctly curved in apical half. TERMINALIA: genital capsule polished, with few punctures laterally, apical margin weakly sinuate; gonostylus as illustrated (Fig. 250). LENGTH of body, 6.34 (5.38-7.19).

FEMALE:- very similar to male, subapical tubercle on midventer of posterior femur sometimes absent; measurements averaging larger: HEAD: length: width:: 1.08 (1.03-1.16): 1.74 (1.60-1.89); interocular width, 1.12 (1.01-1.24); antennals, I, 0.33 (0.30-0.38): II, 0.37 (0.33-0.43): III, 0.31 (0.30-0.36): IV, 0.43 (0.38-0.50): V, 0.49 (0.43-0.53); labials, I, 0.71 (0.63-0.80): II, 0.89 (0.80-1.00): III, 0.78 (0.70-0.84): IV, 0.58

(0.53-0.63). PRONOTUM: width: length:: 3.57 (3.16-3.90): 1.73 (1.49-2.02). SCUTELLUM: length: width:: 2.39 (2.08-2.66): 2.32 (2.08-2.66). LENGTH of body, 6.65 (5.70-7.56).

TYPE DATA: Uhler's (loc. cit.) types, which are now in the United States National Museum, were reported from "Cuba, sent from Havana by Prof. Felipe Poey, and from the interior of the island by Mr. Charles Wright; also, from near St. John's River, Florida." Of Signoret's two types, the specimen from "California" is in the collections of the Naturhistorisches Museum in Vienna, Austria, and bears a red type label; the "Nicaragua" specimen is in the United States National Museum Collection.

DISTRIBUTION: Based on specimens at hand, the range of this species extends from North Carolina, Tennessee and Missouri south to Texas and Florida and onto the islands of the Bahamas and Greater Antilles and with a single specimen (Signoret's cotype) from Nicaragua in Central America.

DISCUSSION: After a study of more than eighty specimens from across the United States and the islands of the Caribbean (including both of Signoret's types) the identity of Aethus communis Uhler and Aethus politus Signoret is apparent. Dr. Sailer compared the types of Signoret's politus with the Uhler types of communis and expressed agreement as to the specific identity of the two. Uhler's species was well defined and so is easily identified; Signoret's species was compared to it and three special differences were pointed out: 1) more constricted form of the prothorax; 2) freer end of the osteolar canal; and 3) the polished area laterad of the evaporative areas being smooth here and "Strioes punctues" in communis. The first two of these appear quite variable, even from the same locality, and combine with other variable characters in several ways. The third character

concerning the sculptured lateral polished area does not appear in any specimens at hand, suggesting that perhaps the specimens of communis to which Signoret referred were unusual in that respect. The most unusual thing about Signoret's types is that they came from widely separated localities outside of the range of the species as determined here; but since both types were seen, there can be no doubt about their being identical with communis.

The goodly series seen showed this to be a rather variable species with certain variations having geographical significance but that the variations are clinal, merging by easy stages from one condition in the north to the other condition in the southern part of the range. Other variations are without geographic occurrence. The two most conspicuous of the geographic variations involve corial punctation and the shape of the head. The corial punctures in specimens from Missouri, Tennessee and North Carolina are distinct, numerous and consistent, while the specimens from Cuba and the Bahamas show distinct punctures only toward base of hemelytra and in rows paralleling claval suture. Specimens from intermediate geographic localities exhibit intermediate conditions so that there is no discontinuous break lending itself to the establishment of a named subspecies. This condition is also true for the shape of the head. Specimens from the northern part of the range have the head in the shape of a strongly flattened, almost truncated semicircle (Fig. 54), and as specimens from gradually more southern localities are studied they are seen to have less truncated outlines to the head until in Cuba, Hayti and the Bahamas they present nearly semicircular forms (Fig. 55).

Among the apparently non-regional variations are: 1) shape of the

pronotal side margins of males which vary from decidedly constricted through weakly to virtually not sinuate; with the most extreme constriction appearing in a series of five specimens from South Bimini Island, Bahama; 2) the apical end of the osteolar canal varies from decidedly limited by an abrupt anterior curving of the posterior free margin through a weaker and shorter curve to having the end fuse imperceptibly with the cuticle beyond; widely varying examples of this often show in material from the same locality; and 3) the development of the subapical tubercle on the midventer of the hind femur varies from completely absent in some females to strong and elevated on a swelling in some males; all males seen showed the tubercle in sufficient development to permit its use to separate males of this species from males of all its congeners except curvipes (Dallas).

SPECIMENS STUDIED: 37 males, 50 females. UNITED STATES: Alabama: Mobile; November. Florida: Crescent City, Dunedin, Gainesville, Indian River, Key West, Lacoochobee, Lakeland, Lutz, Melrose, Miami, St. Augustine; January to December. Georgia: Thomasville, Tifton; July. Illinois: Grant City State Park; June. Mississippi: Biloxi; April. North Carolina: Southern Pines; January. South Carolina: Berkley Co., Florence; February, April. Tennessee: Allardt, Roane Co.; April, June. Texas: Alligator Head, Bastrep, Navasota, Uvalde, Waco; May, June. NICARAGUA: "Nicar." (type of politus). BRITISH WEST INDIES: Anguilla; October. St. Domingo; April. CUBA: Baraqua, Central Saronu, Habana, Maisi Oriente, Pico Turquino, Santiago de las Vegas, Soledad, Taco Taco; April to August. HAYTI: Diquini, Etang Lachaux, Grande Riviere, Petion; August, October. DOMINICAN REPUBLIC: Santo Domingo; May. PUERTO RICO: Bayamon; January. BAHAMAS: South Bimini Island; July.

Tominotus conformis (Uhler) NEW COMBINATION

1876 Trichocoris conformis Uhler, Bull. United States Geol. Geog. Surv. Terr., 1:277.

1877 Trichocoris conformis Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:372.

1882 Aethus conformis Signoret, Ann. Soc. Ent. France, (6) 2:425, pl. 11, fig. 54.

1886 Aethus conformis Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus conformis Lethierry and Severin, Gen. Catal. Hemip., 1:65.

1910 Cydnus conformis Banks, Catal. Nearc. Hemip., p. 99.

1917 Aethus conformis Van Duzee, Univ. California Pubs. Ent., 2:20.

1939 Aethus (Trichocoris) conformis Torre Bueno, Ent. Amer., 19:178.

DIAGNOSIS: Within the genus this species may be recognized by the great abundance of golden hair which not only forms a dense fringe around the outer margin of the insect but also arises individually from many of the coarse punctures of the dorsum and venter.

DESCRIPTION: MALE:- oval. HEAD: wider than long, 1.47 (1.36-1.56): 1.02 (0.93-1.10); interocular width, 0.97 (0.90-1.04); juga semicircular, slightly but distinctly surpassing clypeus, not or only slightly converging in front of latter and leaving a rectangular emargination at apex of head; eyes projecting by more than half their width; clypeus with a few coarse, transverse rugae and two subapical setigerous punctures; jugum with a submarginal row of coarse, close-set punctures giving rise to long cilia and stout pegs, surface with numerous coarse punctures, some of them contiguous in radiating rugae; vertex polished, a few coarse punctures medially; ocelli present, separated from eye by more than ocellar width; jugum ventrally

polished, impunctate; maxillary plate with few coarse punctures, especially posteriorly; antennals, I, 0.36 (0.31-0.40): II, 0.28 (0.25-0.33): III, 0.34 (0.31-0.38): IV, 0.43 (0.40-0.48): V, 0.41 (0.38-0.46); bucculae lower than labial II; labium reaching between middle coxae, segments, I, 0.60 (0.56-0.63): II, 0.86 (0.81-0.90): III, 0.63 (0.60-0.66): IV, 0.48 (0.46-0.51). PRONOTUM: width almost twice length, 3.15 (2.90-3.41): 1.67 (1.47-1.82); anterior margin moderately biemarginate; lateral margins entire, not emarginate opposite ends of transverse impression; latter postmedian, weakly indicated and usually obsolete medially; anterior lobe impunctate except for broad lateral band of coarse, setigerous punctures; posterior lobe with numerous similar setigerous punctures scattered over surface, those along transverse impression coarser, elongate. SCUTELLUM: as long as or slightly longer than width, 2.07 (1.82-2.28): 2.05 (1.82-2.25); surface polished, with coarse, sunken punctures scattered over disc, basal angles impunctate. HEMELYTRON: corial areas well defined, disk with scattered moderate punctures intermixed with finer ones; coarse ones along claval suture forming two rows; exocorium more closely and coarsely punctured; costa with many, close-set, irregularly arranged setigerous punctures; clavus with two irregular rows of coarser punctures; membranal suture straight, lateral angle rounded; membrane reaching apex of abdomen, basal width slightly more than half of length. PROPLEURON: smooth, with a few coarse punctures at antero-ventral angle, in depression and near postero-lateral angle; prosternal carinae ventrally abruptly terminated at almost a right angle, with a broad, deep trough between them. MESOPLEURON: evaporatorium restricted, interrupted on outer half along posterior margin; lateral area in part rugose, with few coarse punctures. METAPLEURON:

evaporatorium slightly surpassing middle of segment, lateral margins concave; lateral area with few coarse punctures; peritreme elongate, becoming evanescent along anterior margin of segment; osteole opening posteriorly in a distinct notch occupied by a small tongue. LEGS: moderately long, posterior tibiae slightly curved. STERNITES: with numerous coarse setigerous punctures irregularly spaced over all but midline. TERMINALIA: genital capsule polished, coarsely, closely punctate on lateral third or more; gonostylus as illustrated (Fig. 251). LENGTH of body: 5.74 (5.06-6.24).

FEMALE:- very similar to male, posterior tibiae straight, measurements averaging larger. HEAD: width: length:: 1.58 (1.50-1.74): 1.06 (1.06-1.10); interocular width, 0.99 (0.96-1.04); antennals, I, 0.40 (0.38-0.43): II, 0.31 (0.30-0.33): III, 0.39 (0.36-0.46): IV, 0.47 (0.46-0.50): V, 0.47 (0.46-0.50); labials, I, 0.59 (0.58-0.60): II, 0.84 (0.76-0.93): III, 0.65 (0.62-0.73): IV, 0.49 (0.48-0.51). PRONOTUM: width: length:: 3.32 (2.90-3.41): 1.77 (1.62-1.77). SCUTELLUM: length: width:: 2.26 (2.08-2.60): 2.25 (2.08-2.72). LENGTH of body, 6.33 (5.68-6.75).

TYPE DATA: The types in the United States National Museum were originally reported "From California, and near San Francisco," by Uhler (loc. cit.).

DISTRIBUTION: All but two of the specimens studied were from Arizona; one of the others, an old one in the Uhler Collection, was labelled "Cala." The other specimen was from central Utah.

DISCUSSION: This very strongly marked species is easily identified, as is attested to by the fact that whenever this name was found attached to a specimen, that specimen was of this species.

SPECIMENS STUDIED: 13 males, 20 females. UNITED STATES: Arizona: Baboquivari Mts., Boyce Thompson Arboretum (Pinal Co.), Catalina Springs, Tempe, Tucson; March to June. California: "Cala." Utah: St. George, Sevier Bridge Reservoir; March, August. MEXICO: Lower California: El Refugio, La Paz, Mesquital, San Ignacio, S. Jose del Cabo, San Pedro; July. Quintana Roo: Espirito Santo I.; June. Sonora: Guaymas; April.

Tominotus curvipes (Dallas) NEW COMBINATION

1851 Aethus curvipes Dallas, List Hemip. Brit. Mus., 1:114.

1867 Aethus curvipes Walker, Catal. Hemip. Brit. Mus., 1:152.

1876 Aethus curvipes Stal, Svenska Vet.-Ak. Handl., 14(4):25.

1882 Aethus curvipes Signoret, Ann. Soc. Ent. France, (6) 2:39, pl.2, fig.81.

1886 Aethus curvipes Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus curvipes Lethierry and Severin, Gen. Catal. Hemip., 1:66.

DIAGNOSIS: The large size, polished dorsum and modified hind tibiae (which in both sexes show a distinct curve in apical third and a flattened space ventrally near base) enable one to readily recognize this species.

DESCRIPTION: MALE:- oval. HEAD: length more than half width, 1.59 (1.38-1.75): 2.55 (2.28-2.73); interocular width, 1.59 (1.33-1.70); juga rounded, forming a flattened semicircle, almost as long as clypeus, latter with two subapical setigerous punctures; jugum with a complete, submarginal row of coarse, close-set, setigerous punctures giving rise to long cilia and stout pegs, surface longitudinally depressed either side of clypeus and with scattered minute punctures; ocelli well developed, separated from eye by more than ocellar width; jugum ventrally polished, impunctate; maxillary plate moderately and very closely punctured; antennals, I, 0.55 (0.49-0.58):

II, 0.68 (0.66-0.71): III, 0.59 (0.50-0.65): IV, 0.79 (0.70-0.86): V, 0.77 (0.75-0.81); bucculae not as high as labial II; labium surpassing middle coxae, segments, I, 1.09 (0.91-1.17): II, 1.39 (1.20-1.50): III, 1.25 (1.03-1.33): IV, 0.89 (0.72-1.00). PRONOTUM: width almost twice length, 5.73 (5.03-6.07): 2.95 (2.69-3.26); anterior margin strongly and broadly emarginate; lateral margins entire, with a submarginal row of about twenty setigerous punctures; transverse impression slightly behind midlength, obsolete to absent medially, marked by a single, irregular row of large, unimpressed (Fig. 71) or coarse, sunken punctures (Fig. 70); anterior lobe impunctate except for a single crescentric row of coarse punctures behind anterior emargination and a few (one to five) or no punctures laterally; posterior lobe with a few punctures medially and laterally. SCUTELLUM: length equal to or greater than width, 3.78 (3.32-4.08): 3.69 (3.30-3.90); numerous coarse punctures scattered irregularly over surface except across base and apex, latter sometimes with several minute punctures. HEMELYTRON: corial areas well defined; disc punctured throughout, more obsoletely so medially, two distinct rows of coarse punctures paralleling claval suture; exocorium closely and distinctly punctured for most of its length; costa with six to ten setigerous punctures; clavus with one or two irregular, longitudinal rows of punctures; membranal suture broadly, shallowly concave, lateral angle acute; membrane usually with distinct fuscous clouds between veins. PROPLEURON: shining, with a few coarse punctures above acetabulum, in depression and near postero-lateral angle; prosternal carinae about half as high as labial II, abruptly terminated posteriorly. MESOPLEURON: evaporatorium interrupted on outer half by polished strip along posterior margin of segment; lateral polished area impunctate. METAPLEURON:

evaporatorium occupying more than two-thirds of segment, lateral margin weakly concave; peritreme abruptly terminated; lateral area impunctate. STERNITES: polished, impunctate, posterior margins sharply and finely crenulate on lateral third or more. LEGS: posterior legs distinctly modified (Fig. 148), femora convex ventrally with a prominent, subapical, conical tubercle, tibiae abruptly and strongly flattened below near base and conspicuously curved in apical third. TERMINALIA: genital capsule shining, with scattered obsolete and minute punctures; gonostylus as illustrated (Fig. 252). LENGTH of body, 10.01 (9.16-10.81).

FEMALE:- rather similar to male, but posterior femora with only a weak indication of the subapical tubercle ventrally, tibiae more weakly but still distinctly flattened and curved as described for male. Measurements averaging somewhat smaller: HEAD: length: width:: 1.55 (1.52-1.59): 2.47 (2.40-2.53); interocular width, 1.48 (1.36-1.59); antennals, I, 0.53 (0.50-0.56): II, 0.64 (0.63-0.66): III, 0.51 (0.50-0.53): IV, 0.73 (0.70-0.76): V, 0.78 (0.76-0.80); labials, I, 1.05 (0.98-1.10): II, 1.39 (1.26-1.50): III, 1.25 (1.10-1.33): IV, 0.87 (0.76-0.93). PRONOTUM: width: length:: 5.42 (5.24-5.58): 2.88 (2.70-2.97). SCUTELLUM: longer than wide, 3.64 (3.45-3.78): 3.37 (3.30-3.45). LENGTH of body, 9.88 (9.61-10.05).

TYPE DATA: Dallas' types, which are now in the British Museum of Natural History, London, England, were listed as coming from "Jamaica" and "S. America."

DISTRIBUTION: Specimens studied were mostly from Jamaica, but a few were from Cat and Andros Islands in the Bahamas (see discussion below).

DISCUSSION: Several interesting types of variation were noted in the small series studied. These included a difference in pronotal punctation,

in degree of concavity of anterior pronotal margin and the size of the ocelli. The pronotal punctation on the specimens from the Bahamas was coarser, impressed and more abundant in the transverse impression (Fig. 70) than on those from Jamaica (Fig. 71). The island of Cuba, which lies between the Bahamas and Jamaica, was not represented in the material studied. A series from Cuba compared with specimens from the other two localities should prove interesting. The degree of concavity of the anterior margin of the pronotum (Figs. 70, 71) and the variation in ocellar size showed no such geographic arrangement.

SPECIMENS STUDIED: 4 males, 11 females. BAHAMAS: Andros Island, May-June, 1904, W. M. Wheeler collector, 1f (AmMus). Andros Island, Mangrove Cay, W. M. Mann, coll., 1f (USNM). Cat Island, Arthur's Town, VII-VIII, 1935, W. J. Clench, 2f (MCZ). South Bimini Island, VI-20-1950, Cazier and Rindge, 2f (AmMus & RCF). Same locality, July, August 10, 15 and 21, 1951, C. & P. Vaurie, 5f (AmMus). JAMAICA: near mouth of Bug River, 30 Mar., 1906, A. E. Wright, 1m (MCZ). Port Antonio, 1m (MCZ). Same locality, Jan., A. E. Wright, 1m, 1f (AmMus). Richmond, Nov. 2, 1m (USNM). Stoney Hill, M. Bovell-37, 1f (USNM).

Tominotus hogenhoferi (Signoret) NEW COMBINATION

1882 Aethus Hogenhoferi Signoret, Ann. Soc. Ent. France, (6), 2:429, pl. 12, fig. 58.

1886 Aethus hogenhoferi Uhler, Checklist Hemip. N. Am., p. 3.

1893 Cydnus Hogenhoferi Lethierry and Severin, Gen. Catal. Hemip., 1:68.

DIAGNOSIS: The broad band of setigerous punctures along the sides of the pronotum plus the impunctate abdomen will identify this species within the genus.

DESCRIPTION: MALE:- (one specimen) oval. HEAD: length more than half of width, 1.43: 2.05; interocular width 1.43; paraclypei rounded, forming a flattened semicircle, as long as anteclypeus, latter with two subapical setigerous punctures; paraclypei with a complete submarginal, depressed row of coarse setigerous punctures giving rise to a row of stout pegs with numerous long cilia scattered between and mesally; surface flattened, vertex and anteclypeus smooth, paraclypei with numerous prominent punctures which converge toward margins; ocelli small, removed from eyes by about twice an ocellar width; paraclypeus ventrally impunctate; maxillary plate with several coarse punctures; antennals, I, 0.53: II, 0.50: III, 0.53 (IV and V missing); bucculae as high as antennal II, almost semicircular; labium reaching between middle coxae, segments, I, 0.95: II, 1.23: III, 0.93: IV, 0.76. PRONOTUM: length more than half of width, 3.01: 5.08; anterior margin broadly and deeply emarginate; lateral margins entire, not emarginate, with a broad submarginal line of many setigerous punctures (Fig. 69); transverse impression at midlength, vague, marked by an irregular row of moderate punctures; anterior lobe polished, impunctate except for a few punctures laterally; posterior lobe polished, with a few scattered punctures finer than those of transverse impression. SCUTELLUM: little longer than wide, 3.45: 3.31; surface smooth, with numerous well-separated punctures becoming fine apically; apex broadly rounded, wider than half of membranal suture. HEMELYTRON: corial areas well defined; surface polished, punctures scattered, fine on apical half, becoming coarser toward base and in two rows paralleling claval suture; radial vein with an irregular row of fine punctures; clavus with three partial rows of punctures; costa with 14 or 15 setigerous punctures; membranal suture weakly bisinuate, rounded

at lateral angle; membrane surpassing apex of abdomen, with prominent, rounded, premedian fuscous spot. PROPLEURON: punctured only at antero-ventral angle, ventrally in depression and in postero-lateral angle; pro-sternal carinae prominent, sharp, abruptly terminated ventrally. MESO-PLEURON: evaporatorium with marginal polished band separating it from posterior margin of segment; latter entire. METAPLEURON: evaporatorium occupying more than half of segment; peritreme extending more than half way across segment, becoming evanescent apically. LEGS: moderately long, not unusually modified. STERNITES: polished, impunctate or with a few fine punctures laterally. TERMINALIA: gonostylus as illustrated (Fig. 253). LENGTH of body, 8.54.

FEMALE:- (two specimens) similar to male, except sometimes the outer row of punctures paralleling claval suture is incomplete; measurements larger: HEAD: 1.43 (1.43-1.43): 2.25 (2.22-2.28); interocular width, 1.50 (1.50-1.51); antennals, I, 0.58 (0.56-0.60): II, 0.54 (0.53-0.56): III, 0.57 (0.53-0.61): IV, 0.75 (0.72-0.78): V, 0.78 (?-0.78); labials, I, 0.98 (0.93-1.04): II, 1.28 (1.23-1.33): III, 1.01 (0.93-1.10): IV, 0.81 (0.80-0.83). PRONOTUM: length: width:: 2.97 (2.95-2.99): 5.46 (5.38-5.55). SCUTELLUM: length: width:: 3.45 (3.29-3.61): 3.53 (3.44-3.61). LENGTH of body, 9.64 (9.38-9.90).

TYPE DATA: The two specimens on which Signoret based his original description are in the Naturhistorisches Museum, Wien. The specimens, which were generously loaned by Dr. M. Beier of that institution, are in a some-what poor condition but clearly recognizable as this. The specimen bearing the "type" label was from "Mexico", the other is labelled "Guatemala, Escuiatla." On both specimens the trivial name begins with the letter "R"

instead of the "H" which appeared in the original citation. The type localities as given with the original description were simply "Guatemala, Mexico."

DISTRIBUTION: The three specimens studied were from Mexico. This species appears to be restricted to the Central American isthmus.

DISCUSSION: Each of the three specimens examined had been determined by a different worker, and all agreed as to the identity of their specimens with this as all were labelled "Aethus hogenhoferi."

The present author considers the use of the initial letter "R" in the trivial name by Lethierry and Severin (loc. cit.) an unnecessary emendation from the letter "H" which appeared in the original description.

SPECIMENS STUDIED: 2 males, 3 females. Chi. III (of unknown significance, may mean Chiapas, Chihuahua or some other locality in Mexico from which country the type and two of the other specimens came), 1m (USNM). MEXICO: Mexico, labelled "Type" (Vienna). State of Colima, Col., Mex., L. Conradt Collector, 2f (USNM). GUATEMALA: Escuintla, 1879, III (part of Signoret's original series) (Vienna).

Tominotus impuncticollis (Distant)

1880 Pangaeus impuncticollis Distant, Biol. Centr.-Amer., Rhynch., 1:7, pl. 3, fig. 7.

1882 Aethus impuncticollis Signoret, Ann. Soc. Ent. France, (6) 2:428, pl. 12, fig. 57.

1893 Cydnus impuncticollis Lethierry and Severin, Gen. Catal. Hemip., 1:66.

DIAGNOSIS: This species may be recognized by the broad scutellar apex and the absence of distinct punctures laterally on pronotal disc.

DESCRIPTION: MALE:- oval. HEAD: length about two-thirds width, 1.29

(1.24-1.36): 1.92 (1.89-2.01); interocular width, 1.41 (1.36-1.43); anterior outline a slightly truncated semicircle, clypeus almost as long as juga, narrowed apically, with two subapical setigerous punctures; submarginal setigerous punctures bearing full row of stout pegs and few long hairs; surface flattened, obsoletely punctate, moderate rugae radiating from base of clypeus, latter with few transverse rugae; ocelli small, separated from eyes by space greater than three times transverse ocellar width; jugum ventrally and maxillary plate impunctate; antennals, I, 0.44 (0.41-0.50): II, 0.39 (0.36-0.41): III, 0.48 (0.45-0.50): IV, 0.57 (0.55-0.60): V, 0.62 (0.61-0.64); bucculae higher than labial II, almost semicircular; labium reaching between middle coxae, segments, I, 0.67 (0.63-0.83): II, 0.98 (0.96-1.00); III, 0.84 (0.80-0.96): IV, 0.65 (0.63-0.66). PRONOTUM: length more than half width, 2.56 (2.50-2.70): 4.67 (4.56-4.76); anterior margin deeply, roundly emarginate; lateral margin entire, not emarginate, with submarginal row of twenty to twenty-three setigerous punctures; transverse impression absent or weakly indicated laterally; disk with few widely-scattered, very fine punctures. SCUTELLUM: length usually slightly greater than width, 3.07 (3.00-3.15): 2.96 (2.85-3.01); discally with few scattered, moderate punctures. HEMELYTRON: clavus and corium polished; clavus with irregular row of punctures; mesocorium with obsolete, fine punctures becoming slightly more distinct basally, row paralleling claval suture represented by few, usually separated punctures; exocorial punctation stronger, more abundant than that on mesocorium; costa with four setigerous punctures; membranal suture nearly straight (Fig. 82); membrane reaching base of abdomen. PROPLEURON: shining, with distinct punctures in depression and above acetabulum. PROSTERNAL carinae

less than half as high as labial II, truncated posteriorly. MESOPLEURON: evaporatorium interrupted posteriorly by polished band; lateral area roughly, rugo-punctate. METAPLEURON: lateral margin evaporatorium concave; lateral area coarsely punctate near evaporatorium. LEGS: not unusually modified. STERNITES: smooth, punctate only laterally. TERMINALIA: genital capsule shining, with few scattered, distinct punctures, apical margin almost straight; gonostylus as illustrated (Fig. 254). LENGTH of body, 8.55 (8.40-8.70).

TYPE DATA: Distant's (loc. cit.) types were from "Mexico; Panama," and now are in the collection of the British Museum of Natural History.

DISTRIBUTION: The several Mexican specimens studied coupled with the original localities cited above indicate that this species occurs only in Central America.

DISCUSSION: Distant's (1880:7) statement in the original description that the margins of the pronotum "are sparingly fringed with long hairs" may have been true of his specimens, but the great number of setigerous punctures indicate that twenty or more hairs should be present in unrubbed specimen.

SPECIMENS STUDIED: 5 males. MEXICO: Mexico, labelled Ectinopus holomelas and Aethus impuncticollis, 1m (USNM). Mex., X, labelled Aethus impuncticollis by Linell, 1m (USNM). Distrito Federal: Lomas de Chapultepec, VI-28-32, 1m (RLU). Hidalgo: 5 mi N. Tizayuca, XI-13-46, E. S. Ross, 2m (CalAc).

Tominotus insularis (Westwood)

1837 Cydnus insularis Westwood, Catal. Hemip. Coll. Hope, p. 19.

1851 Aethus insularis Dallas, List. Hemip. Brit. Mus., 1:120.

1867 Aethus insularis Walker, Catal. Hemip. Brit. Mus., 1:152.

1867 Aethus rubrifemur Walker, Catal. Hemip. Brit. Mus., 1:153.

1876 Cydnus insularis Stal, Svenska Vet.-Ak. Handl., 14(4):26.

1879 Cydnus laeviculus Berg, Hemip. Argentina, p. 11.

1882 Aethus insularis Signoret, Ann. Soc. Ent. France, (6) 2:37, pl. 2, fig. 78.

1882 Aethus distinctus Signoret, Ann. Soc. Ent. France, (6) 2:37, pl. 2, fig. 79 (NEW SYNONYMY).

1893 Cydnus insularis Lethierry and Severin, Gen. Catal. Hemip., 1:66.

DIAGNOSIS: The small size, body length 3.7-4.5, and the presence of two setigerous punctures subapically on the clypeus will mark this species from its congenors.

DESCRIPTION: MALE:- elongate oval, costa subparallel on basal half. HEAD: length almost two-thirds width, 0.74 (0.71-0.81): 1.10 (1.02-1.16); interocular width, 0.89 (0.63-0.73); anterior outline semicircular, clypeus as long as juga, narrowed apically and with two subapical setigerous punctures; jugum with a complete, submarginal row of setigerous punctures bearing a row of stout, blunt pegs and few hair-like setae between; surface shining, with few distinct, oblique rugae, punctation becoming coarser and more abundant towards margins; ocelli well developed, separated from eyes by space nearly twice transverse ocellar width; jugum ventrally and maxillary plate, except basally, polished, impunctate; antennals, I, 0.21 (0.16-0.24): II, 0.18 (0.16-0.20): III, 0.24 (0.23-0.26): IV, 0.27 (0.26-0.30): V, 0.34 (0.33-0.36); bucculae almost as high as labial II; labium reaching between middle coxae, segments, I, 0.37 (0.35-0.40): II, 0.54 (0.50-0.61): III, 0.42 (0.41-0.43): IV, 0.34 (0.33-0.36). PRONOTUM:

length about half width, 1.17 (1.10-1.21); 2.27 (2.11-2.40); anterior margin deeply, doubly emarginate; lateral margins entire, straight on basal half, with submarginal row of seven to ten setigerous punctures; transverse impression moderately impressed, obsolete medially, marked by regular, medially-interrupted row of punctures; punctation of anterior lobe restricted to broad lateral area and subapical line; posterior lobe with scattered fine and coarse punctures. SCUTELLUM: length little greater than width, 1.46 (1.36-1.56); 1.40 (1.29-1.49); polished; almost impunctate across base, discally with numerous scattered punctures becoming slightly finer toward apex. HEMELYTRON: clavus and corium polished; clavus with one complete and basal half of second row of punctures; corium with numerous punctures becoming larger and more crowded basally; costa with two to four setigerous punctures; membranal suture virtually straight, lateral angle not produced; membrane surpassing apex of abdomen. PROPLEURON: shining, with few punctures in depression; prosternal carinae about half as high as labial II. MESOPLEURON: evaporatorium following posterior margin to lateral margin thence continued forward along lateral margin; lateral area impunctate. METAPLEURON: lateral margin of pronotum straight; lateral area impunctate. LEGS: not specially modified. STERNITES: shining, impunctate except in spiracular area. TERMINALIA: genital capsule shining, with few punctures in lateral angles, apical margin slightly sinuate medially; gonostylus as illustrated (Fig. 255). LENGTH of body, 4.27 (4.08-4.50).

FEMALE:- similar to males. HEAD: length: width:: 0.74 (0.70-0.78): 1.10 (1.03-1.15); interocular width, 0.70 (0.66-0.73); antennals, I, 0.21 (0.20-0.23): II, 0.18 (0.16-0.20): III, 0.24 (0.23-0.26): IV, 0.29 (0.26-0.30): V, 0.35 (0.35-0.36); labials, I, 0.37 (0.34-0.40): II, 0.57

(0.53-0.61): III, 0.41 (0.38-0.43): IV, 0.33 (0.32-0.36). PRONOTUM: length: width:: 1.14 (0.97-1.21): 2.20 (2.00-2.31). SCUTELLUM: length: width:: 1.42 (1.31-1.56): 1.37 (1.23-1.49). LENGTH of body, 4.16 (3.74-4.35).

TYPE DATA: The type of this species, which is probably in the Hope collection at Oxford, England, was described by Westwood (loc. cit.) from "Insula Sti. Vincentii." Walker's (loc. cit.) type of rubrifemur, which is now in the collection of the British Museum of Natural History, was from "Rio Janeiro," Brazil. The single type of Berg's (loc. cit.) laeviculus, which now appears to be lost, came from "Buenos Aires," Brazil. Signoret's type of distinctus has not yet been located, but was reported as having come from "Montevideo," Uruguay.

DISTRIBUTION: All specimen-records available during this study were from Brazil, none from the West Indies. Additional remarks on this point are given below.

DISCUSSION: Because answers to queries concerning the type of insularis have not yet arrived, Signoret's practice of assigning this name to a continental South American form is followed here. The fact that no specimens of the present species were included in the abundant study material from the West Indies suggests that this action is open to serious question. However, the original description apparently offers no definitive feature that will enable the student to confidently assign it to one genus, much less to a specific group of specimens. Therefore, rather than make another equally uncertain assignment, the author prefers to accept current practice until new information settles the matter. The author is confident, however, that when data from the type are available insularis will be found to be not as Signoret treated it, but as a member of some other

genus, not Tominotus.

Although the author has not seen Signoret's type of distinctus he feels that it belongs in synonymy under insularis, or laeviculus (both have precedence over Signoret's name) if insularis does prove to belong to another species. The reason for this interpretation lies in the author's reluctance to accept Signoret's species when they are separated from closely allied forms on the basis of the osteolar peritreme alone. Sufficient evidence is available in other parts of the family (i.e., his separation of Homaloporus pangaeiformis from H. congruus, of "Aethus politus from A. communis, and other examples) to cause one to question the accuracy of his observations here. Study of the type may refute this conclusion. Signoret (1882:37) had synonymized laeviculus Berg, while authority for this assignment of rubrifemur Walker rests in Distant's (1899:230) efforts to place Walker's species on a modern foundation.

SPECIMENS STUDIED: 8 males, 11 females. BRAZIL: Baixa Verde, Rio Grande do Norte, Mann, 1m (MCZ). Chapada, Acc. 2966, July and August, 6m, 6f (Carn). Estancia Sergipes, Dec. 1929, R. C. Shannon, 1f (USNM). Nova Teutonia, Santa Catarina, VIII-26, 1950 and XI-28, 1950, F. Plaumann, 2f (JCL). Para, Acc. No. 2966, July, 1m, 1f (Carn).

Tominotus nigropunctatus (Berg) NEW COMBINATION

1879 Cyrtomenus nigro-punctatus Berg, Hemip. Argentina, p. 12.

1882 Cydnus nigropunctatus Signoret, Ann. Soc. Ent. France, (6) 2:145, pl. 6, fig. 84.

1893 Cydnus nigropunctatus Lethierry and Severin, Gen. Cat. Hemip., 1:67.

DIAGNOSIS: Although no specimens of the present species have been examined during this study, nigropunctatus appears distinct, not only in

the unique color pattern of black maculae and punctures on a yellowish ground color as emphasized by Berg in the original description and Signoret (1882:145), but also by the combination of the broad scutellar apex and the mesopleural evaporatorium extended into the postero-lateral angle of the segment (vide Signoret 1882: fig. 84).

DESCRIPTION: In the absence of specimens for study, the original description is copied herewith:

> ♂ et ♀: Ovales, subnitidi, saturate testacei, supra nigro-punctati et maculati; capite aequaliter rotundato, sat convexo, subradiatim rugoso, seta una alterave instructo, postice marginibusque tyli nigro-fuscis, margine leniter reflexo, intra eam spinis setisque numerosis, nigricantibus; antennis articulo secundo tertio paullo longiore; oculis valde distinctis, nigris aut obscure testaceis; ocellis rubris; pronoto antice quam postice 1/3 angustiore, lateribus apicem versus subrotundatis, margine leviter reflexo sulco valde setoso, impressione transversa ante medium obsoleta, o impressione alteraque post marginem anteriorem sat distincta, toto nigro-punctato partibus lateralibus prothoraceque exceptis, hujus maculis duabus calceiformibus, obscure fuscis; scutello nigro-punctato, basi apiceque offuscato aut nigro-maculato, hoc impressione distincta; corio margineque clavi nigro-punctatis, seriebus daubus punctorum subobsoletis, margine costali immaculato, testaceo, vix punctulato vel cicatricoso; membrana testacea, parum offuscata.
>
> Subtus laeves, testacei, pilis parce vestiti; abdomine ciliato; tibiis fusco-spinosis, anterioribus modice dilatatis, longe-spinosis.
>
> Long. 3-5; lat. 2 1/2 mm.
>
> Patria: Mendoza.

TYPE DATA: Berg's (loc. cit.) pair of specimens were from "Mendoza," Argentina. These types are now in the collection of the Museo de la Univeridad Eva Peron (formerly Museo de La Plata) according to a recent letter from N. Kormilev.

DISTRIBUTION: The only locality of capture reported in literature is the type locality in Argentina.

DISCUSSION: The placement of nigropunctatus in Tominotus is purely tentative and based only on circumstantial evidence. This evidence consists chiefly of the original description and Signoret's (1882) subsequent treatment of one of Berg's types along with T. blanchardi. Signoret placed both of these species in his genus Cydnus which he characterized as having a differentiated, auricular structure terminating the peritreme. Examination of a single, rather badly damaged specimen of blanchardi showed that Signoret misrepresented the apical structure of the peritreme and that it belonged to Tominotus as presently delimited. Nigropunctatus was also figured by Signoret (in the same paper) as having a similar terminal structure and so probably also belongs here. In addition, Tominotus is the only genus of South American Cydnidae known to possess the combination of the broad scutellar apex. Until undoubted specimens of nigropunctatus are examined and invalidate these conclusions, the author prefers to consider the present species as a member of the genus Tominotus.

SPECIMENS STUDIED: none.

Tominotus signoreti Mulsant and Rey (Fig. 6)

1866 Cydnus (Tominotus) signoreti Mulsant and Rey, Ann. Soc. Linn. Lyon, (n.s.) 13:319.

1879 Cyrtomenus constrictus Berg, Hemip. Argentina, p. 277.

1882 Aethus (Tominotus) constrictus Signoret, Ann. Soc. Ent. France, (6): 2:427, pl. 12, fig. 56.

1893 Cydnus signoreti Lethierry and Severin, Gen. Catal. Hemip., 1:68.

DIAGNOSIS: The broad scutellar apex, the single, lateral submarginal row of setigerous punctures and the unicolorous corium and legs combine to

separate this species from others within the genus. The pronotal constriction shown by the males is the deepest and most abrupt found in any Western Hemisphere cydnid.

DESCRIPTION: (this description based on a single male and a single female). MALE:- rounded oval. HEAD: length about two-thirds width, 1.00: 1.46; interocular width, 1.06; outline semicircular, eyes projecting by about one-third their width; juga shining, with faint radiating rugae; surface, including base of clypeus, faintly alutaceous, with scattered minute punctures; clypeus with two subapical setigerous punctures; juga with submarginal row of setigerous punctures bearing only long cilia, no pegs; juga ventrally and maxillary plate polished, impunctate; antennals, I, 0.23: II, 0.25: III, 0.30: IV, 0.33: V, 0.33; bucculae low, evanescent posteriorly (Fig. 35); labium reaching between middle coxae (? as in female ?), segments, I, 0.56: II-IV missing. PRONOTUM: width more than twice length, 3:32: 1.56; anterior margin deeply biemarginate; side margins very deeply and abruptly constricted opposite ends of transverse groove (Fig. 6), with single, submarginal row of twenty-five to twenty-seven setigerous punctures, one setigerous puncture near base set mesad of this row; transverse groove absent; anterior lobe laterally with broad area of prominent punctures; posterior lobe, except hind margin, punctured across width. SCUTELLUM: distinctly wider than long, 2.28: 1.75; triangular, apex not narrowed (Fig. 80); impunctate basally, discally with numerous close-set, moderate punctures becoming finer posteriorly. HEMELYTRON: corial areas well defined, alutaceous and rather uniformly punctured on discal and exocorial areas with two rows of closer set punctures paralleling claval suture; clavus finely alutaceous, with irregular rows of fine punctures;

costa with thirteen to fifteen punctures; membranal suture bisinuate; membrane longer than basal width, somewhat surpassing apex of abdomen. PROPLEURON: impunctate; prosternal carinae prominent, thick, calloused, abruptly and rectangularly terminated ventrally. MESOPLEURON: (Fig. 111) evaporatorium interrupted by a broad polished band along posterior margin. METAPLEURON: (Fig. 111) evaporatorium occupying almost mesal half of segment, lateral margin well defined, deeply concave. STERNITES: shining, very weakly alutaceous, weakly and finely rugose and punctured laterally. TERMINALIA: genital segment marginally carinate and slightly expanded; gonostylus as illustrated (Fig. 256). LENGTH of body: 5.14.

FEMALE:- generally similar to male but lacking constriction of pronotal side margins and the extra pronotal setigerous puncture in the posterior angle mesad of the submarginal row; measurements (in the single female studied) slightly smaller than those of male: HEAD: width: length:: 1.43: 0.96; interocular width, 1.00; antennals, I, 0.33: II, 0.26: III, 0.28: IV and V missing; labial segments, I, 0.56: II, 0.64: III, 0.53: IV, 0.43. PRONOTUM: width: length:: 3.26: 1.43. SCUTELLUM: width: length:: 2.08: 1.69. LENGTH of body: 5.00.

TYPE DATA: Mulsant and Rey (loc. cit.) originally gave their type locality as "Montpellier," France, but Signoret (1882:428) later pointed out their misinterpretation of his label "Mont." which he said stood for "Montevideo," Uraquay. Berg (loc. cit.) gave the type locality for constrictus as "Provincia Bonaerensis," Argentina. The author has been unsuccessful in locating the type of signoreti; but has learned that Berg's type is in the Museo de la Univeridad Eva Peron (formerly Museo de La Plata).

DISTRIBUTION: This well-marked species has been reported from Argentina, southern Brazil and Uraguay, while the pair at hand had been collected in Paraguay. The species thus appears to occur only in southern South America.

DISCUSSION: Pertinent comments concerning this species will be found in the introductory discussion to the present genus.

SPECIMENS STUDIED: 1 male, 1 female. PARAGUAY: Fiebrig, Paraguay, S. Bernardino, 1m, 1f (Vienna).

Tominotus subtilius (Signoret) NEW COMBINATION

1881 Homaloporus subtilius Signoret, Ann. Soc. Ent. France, (6) 1:331, pl. 11, fig. 49.

1886 Homaloporus subtilisus [1] Uhler, Checklist Hemip. N. Am., p. 3.

1893 Homaloporus subtilius Lethierry and Severin, Gen. Catal. Hemip., 1:65.

DIAGNOSIS: Among those species of the genus which measure less than 6 mm. in length, this one may be recognized by the lack of subapical setigerous punctures on the clypeus and the few (two to six) setigerous punctures on the costa.

DESCRIPTION: MALE:- oval. HEAD: length about two-thirds width, 0.81 (0.80-0.86): 1.29 (1.26-1.37); interocular width, 0.79 (0.76-0.83); anterior outline semicircular, clypeus equalling juga, narrowed apically, without subapical setigerous punctures; juga with complete row of submarginal, setigerous punctures bearing full row of pegs and few hairs between; surface shining, with widely-scattered fine punctures; ocelli moderate, separated from eye by space almost twice ocellar width; jugum ventrally and maxillary plate (except basally) shining, impunctate;

antennals, I, 0.24 (0.23-0.26): II, 0.24 (0.23-0.26): III, 0.29 (0.27-0.32): IV, 0.36 (0.34-0.39): V, 0.41 (0.40-0.43); bucculae almost as high as labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.41 (0.40-0.43): II, 0.64 (0.60-0.71): III, 0.50 (0.47-0.55): IV, 0.37 (0.37-0.38). PRONOTUM: length about half width, 1.33 (1.30-1.40): 2.60 (2.40-2.73); anterior margin moderately emarginate; lateral margins entire, straight on middle third or more, with submarginal row of seven or eight setigerous punctures; transverse impression slightly impressed, obsolete at middle, marked by medially interrupted row of close-set punctures; anterior lobe with large and fine punctures intermixed laterally and in subapical, depressed row; posterior lobe with very widely scattered punctures somewhat more numerous medially. SCUTELLUM: length greater than width, 1.75 (1.69-1.88): 1.65 (1.60-1.71); impunctate basally, discal punctation becoming finer and closer toward narrowed apex. HEMELYTRON: clavus and corium polished; clavus with one complete and one partial row of punctures; mesocorium with two rows of punctures paralleling claval suture, discally with fine scattered punctures becoming denser and coarser basally and sometimes apically; exocorium more uniformly and closely punctate; costa with two to four setigerous punctures; membranal suture straight, lateral angle not produced; membrane surpassing apex of abdomen. PROPLEURON: shining, with few punctures in depression and above acetabulum. MESOPLEURON: evaporatorium reaching lateral margin; lateral area impunctate. METAPLEURON: lateral margin of evaporatorium straight; lateral area impunctate. LEGS: not specially modified. STERNITES: shining, impunctate, more or less rugopunctate in spiracular area. TERMINALIA: genital capsule shining, with few fine punctures laterally, apical margin sinuate medially; gonostylus as illustrated (Fig. 258). LENGTH of body, 5.10 (4.87-5.44).

FEMALE:- similar to male. HEAD: length: width:: 0.85 (0.79-0.92): 1.31 (1.23-1.37); interocular width, 0.81 (0.78-0.87); antennals, I, 0.27 (0.25-0.33): II, 0.24 (0.22-0.30): III, 0.28 (0.26-0.31): IV, 0.33 (0.31-0.36): V, 0.40 (0.36-0.43); labials, I, 0.44 (0.40-0.51): II, 0.64 (0.62-0.66): III, 0.45 (0.43-0.49): IV, 0.36 (0.34-0.41). PRONOTUM: length: width:: 1.40 (1.31-1.52): 2.66 (2.53-2.86). SCUTELLUM: length: width:: 1.76 (1.62-1.88): 1.67 (1.56-1.82). LENGTH of body, 4.97 (4.89-5.39).

TYPE DATA: The type specimen has not yet been located. It is not in the Signoret collection in the Naturhistorisches Museum in Vienna. The original description stated that it was from "Cordoba (Conf. Arg.)."

DISTRIBUTION: The material studied had come from widely scattered localities in Brazil and from Argentina.

DISCUSSION: Although Signoret originally described this species as a member of the genus Homaloporus, its proper placement is probably here. The illustration of an uninterrupted mesopleural evaporatorium suggests that subtilius is not especially closely related to the two closely allied northern groups, Homaloporus and the subgenus Boreopangaeus neither of which possesses a complete evaporatorium. The presence of a subapical impressed line on the pronotum (a feature of both Homaloporus and Pangaeus) could possibly be imagined from the depressed row of punctures shown on the present species if one used the loose interpretation of that structure as was frequently done during Signoret's time. In addition, the present species is the only one from southern South America which approaches Signoret's description and figure, differing only in that the subapical line is an obtusely impressed row of punctures rather than a sharply delimited impressed line. These conclusions and interpretations are only

practical working steps and, as is true of a number of similar cases in this study, are subject to correction or confirmation when the type is actually located.

SPECIMENS STUDIED: 8 males, 11 females. BRAZIL: Brasil, 1m, 1f (AmMus). Natal, Mann coll., 1f (MCZ). Nova Teutonia, Santa Catarina, X-17, 1950, F. Plaumann, 1f (JCL). Santarem, Acc. 2966, 2m, 2f (Carn). Taperina, Acc. No. 2966, 5m, 5f (Carn). ARGENTINA: La Plata, Spegezini, 1f (MCZ).

Tominotus unisetosus NEW SPECIES

DIAGNOSIS: Among its congenors with the uninterrupted mesopleural evaporatorium this species may be recognized by the single setigerous puncture on the costa.

DESCRIPTION: MALE:- elongate, subparallel. HEAD: width one-half greater than length, 1.26 (1.16-1.36): 0.87 (0.86-0.90); interocular width, 0.80 (0.80-0.83); juga semicircular, converging but not contiguous beyond apex of clypeus; latter with two setigerous punctures subapically; juga with submarginal punctures giving rise to peg-like setae anteriorly and long slender setae basally; surface faintly to distinctly rugose radially, with numerous rounded, wide but shallow punctures; vertex with punctures minute or absent; ocelli well developed, removed from eye by more than ocellar width; jugum ventrally polished, impunctate; maxillary plate with few punctures posteriorly; antennals, I, 0.26 (0.26-0.27): II, 0.33 (0.30-0.36): III, 0.34 (0.33-0.36): IV, 0.41, (0.40-0.46): V, 0.48 (0.46-0.50); bucculae as high as labial II; labium reaching between middle coxae, segments, I, 0.48 (0.46-0.50): II, 0.67 (0.66-0.70): III, 0.59 (0.53-0.68): IV, 0.43 (0.40-0.46). PRONOTUM: width about twice length,

2.60 (2.40-3.06): 1.32 (1.23-1.49); anterior margin strongly emarginate; side margins convex, not sinuate nor constricted at ends of transverse groove, more abruptly narrowed anteriorly; lateral submarginal row with six or seven setigerous punctures; transverse groove weak, marked by a row of close-set, prominent punctures; anterior lobe impunctate discally, with an irregular double row of prominent punctures and numerous minute ones; submarginally at apex between eyes and laterally with numerous punctures similar to those of transverse groove; posterior lobe polished, with few scattered, moderate punctures and more numerous minute ones on median disk and laterally. SCUTELLUM: distinctly longer than broad, 1.83 (1.69-2.06): 1.64 (1.56-1.82); triangular, apex narrowed; disk with numerous distinct, irregularly placed punctures except on basal fifth and on apex. HEMELYTRON: corial areas well defined, polished; mesocorium with numerous punctures, these obsolete on middle third, coarser and closer set in two rows paralleling claval suture; exocorial area distinctly, closely and rather irregularly punctured throughout; costa with a single, subbasal, setigerous puncture; clavus with a disrupted, submedian row of distinct, close-set punctures; membranal suture straight; membrane slightly surpassing apex of abdomen, length and basal width subequal. MESOPLEURON: evaporatorium extensive, reaching postero-lateral angle of segment and prolonged forward along side margin; posterior margin finely crenulate. METAPLEURON: evaporatorium occupying more than mesal three-fourths of segment, obliquely and abruptly separated from impunctate lateral polished area. STERNITES: shining, impunctate, irregularly sculptured with obsolete to distinct longitudinal rugae. TERMINALIA: subgenital plate with apical margin slightly flaring and broadly, deeply sinuate at middle apex;

gonostylus as illustrated (Fig. 257). LENGTH of body, 4.88 (4.57-5.28).

FEMALE:- very similar to male, measurements averaging larger: HEAD: width: length:: 1.33 (1.30-1.40): 0.89 (0.86-0.93); interocular width, 0.82 (0.81-0.86); antennals, I, 0.27 (0.26-0.30): II, 0.33 (0.30-0.36): III, 0.33 (0.30-0.36): IV, 0.44 (0.40-0.46): V, 0.54 (0.46-0.60); labial segments, I, 0.47 (0.46-0.50): II, 0.73 (0.66-0.76): III, 0.59 (0.56-0.65): IV, 0.44 (0.43-0.47). PRONOTUM: width: length:: 2.64 (2.47-2.79): 1.40 (1.30-1.49). SCUTELLUM: length: width:: 1.99 (1.89-2.15): 1.64 (1.56-1.82). LENGTH of body, 4.95 (4.57-5.28).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both in the collection of the United States National Museum and labelled, "Brownsville, Tex., Mar. 14, 1936, P. A. Glick, Coll., cotton on roots in soil." PARATYPES: UNITED STATES: Texas: Austin, 3-1-01, 1m (USNM). Austin, VIII-24-27, D. Rockefeller Exp., Gertsch, 1f (AmMus). Bexar Co., No. T-3302, from soil Peach Orchard, Wm. F. Turner, Coll., 1m labelled Aethus sp. det. H. G. Barber, 2f; next four with same locality - 11-9-38, W. F. Turner, 9019, 1f; III-1937, W. F. Turner, 3385, 1f; 3-27-32, under litter, T 3282, 1f; V-5-38, W. F. Turner, 11D-14, 1f; 7-16-37, W. F. Turner, 5446, 1m; XI-6-36, 1f (all in USNM). Brazos Co., Collection N. Banks, 1f (MCZ). Brownsville, June, 4f, one labelled Homaloporus sp. perhaps pangaeiformis Sign., det. E. P. Van Duzee (KU); with same data, double mount of 2f, labelled Pangaeus bilineatus Say, Snow Coll., and on second label Aethus n. sp., det. H. G. Barber (USNM); with same data, double mount of 2f, labelled Rhytidoporus sp. in Van Duzee's handwriting (CalAc). Brownsville, X-42, E. S. Ross, at light, 3f (CalAc). Brownsville, VI-03, Collection of H. G. Barber, 1f, with determination of Cydnus communis crossed out (USNM). Brownsville, VI-11-16,

1938, Darlington, 2f (MCZ). Brownsville, Mar. 3, 4, 10, 11, 14, 1936, cotton on roots in soil, 6f, 2ny (USNM). Esper. Rch., Brownsville, Catal. No. 15, Brooklyn Museum Coll. 1929, 1f (USNM). Esprza. Rch., Brownsville, VII-16, Catal. No. 19, Brooklyn Museum Coll. 1929, 1f with determination Cydnus communis crossed out (USNM). Del Rio, 7-8-38, R. I. Sailer, 1f (USNM). Harlingen, IX-1, 1945, Coll. D. E. Hardy, 1f (Sl). Hidalgo Co., 6/6, 1930, J. C. Gaines Collector, Tex. Exp. Sta. Light Trap, 2f, one labelled Aethus sp. (HMH). Runge, 24-IX-06, 1f, nighthawk stomach (USNM). San Angelo, Tom Green Co., VI-28-48, C. & P. Vaurie, 1f (AmMus). San Antonio, VII-7-42, E. S. Ross, 1f (CalAc). San Juan, 6-28-39, L. W. Hepner, 1f (KU). Tex., 3-27-00, 1m labelled Geotomus parvulus, second label with note by Van Duzee, does not agree (USNM). Tex., Feb., A. L. Melander, 1f labelled Pangaeus sp. (HMH). Uvalde, VIII-4-37, D. J. & J. N. Knull Colls., 1f (JCL). MEXICO: Guerrero: 3 mi. N. Chilpancingo, XI-18-46, 1f (CalAc). Jalisco: Colima Vulcana, L. Conrad, 1f (USNM). Mexico: Tejupilco, Temescaltepec, VI-16-33, H. E. Hinton, R. L. Usinger collectors, 3m, 5f (RLU). Morelos: Cuernavaca, VI, 1m (ISC). Oaxaca: Tuxtepec, J. Canelo, G., 5-21-34, #894, 1f (USNM). San Luis Potosi: 18 miles S. Tamazunchale, XI-22-46, E. S. Ross Collector, 1f (CalAc). GUATEMALA: 70 mi. E. of Guat. City, May 8, 1947, R. R. Miller, 1f (USNM). Panzos, 100 ft., VII-17-1947, F. Johnson Donor, C. & P. Vaurie Colls., 1f (AmMus). COSTA RICA: Bebedero, Reimoser, 1m, 5f (Vienna). Philadelphia, Banana R., Oct. 1, '05, Fred K. Knab Collector, 1f (USNM). San Isidro bei S. Jose, E. Reimoser, 1f (Vienna).

DISTRIBUTION: The type material listed above shows that this species ranges from Texas south through Mexico and Guatemala to Costa Rica.

DISCUSSION: That such a common species should not have been previously described is quite surprising. However, the confusion that seems to permeate the studies of this family is very evident from the variety of determinations listed above, even to the extent of one hemipterist placing specimens of one series under two generic names. The present species shows very little variation except in the abundance of punctures laterally on the anterior pronotal lobe.

An unusual number of specimens, all of them from Texas, bore ecological data, with such notes as "cotton, on roots in soil," "at light," "from soil, peach orchard," and "nighthawk stomach."

Genus Dallasiellus Berg

1880 Stenocoris Signoret, Ann. Soc. Ent. France, (5) 10:xliv (nec Burmeister, 1839:1010, in hemipterous family Coreidae; nec Rambur, 1839:139, in hemipterous family Lygaeidae).

1891 Dallasia Bergroth, Rev. d'Ent., 10:235 (nec Stokes, 1886:534, in Protozoa).

1901 Dallasiellus Berg, Com. Mus. Buenos Aires, 1:281.

1919 Colobophrys Horvath, Ann. Mus., Nat. Hungarici, 17:244 NEW SYNONYMY.

1919 Geocnethus Horvath, Ann. Mus. Nat. Hungarici, 17:245 (in part) NEW SYNONYMY.

DIAGNOSIS: This genus is best recognized among those cydnid genera of the Western Hemisphere that lack a differentiated terminal lobe of the osteolar peritreme by the incomplete, submarginal row of setigerous punctures on the juga and the absence of a subapical, impressed line on the pronotum.

DESCRIPTION: Size small to large, 3.7 to 11.5; form oval to parallel-sided; dorsum less strongly convex than venter. HEAD: length more than half width; eyes weakly to strongly projecting; juga as long as or longer than clypeus and convergent in front of it; surface more or less flattened, with no punctures, scattered punctures or coarse confluent punctures; margin with or without fine dorsal carina; ocelli small to moderate, situated on or posterior to line connecting hind margins of eyes; antennae five-segmented, relative lengths of segments variable, I usually shortest and V usually longest; bucculae moderately to very high, reaching nearly or quite to base of head; labium reaching from between middle coxae to third sternite, II longest, I or IV shortest. PRONOTUM: width less than to more than twice the length; side margins usually narrowed from base, with submarginal row of setigerous punctures; anterior margin moderately to deeply concave; transverse impression median or postmedian, weakly to strongly impressed; posterior margin broadly but shallowly convex. SCUTELLUM: longer than broad, apex narrowed, less than half of membranal suture; disk with or without punctures. HEMELYTRON: corial areas well defined; membranal suture straight or sinuate, lateral angle prolonged or not; corial punctation variable; membrane less than half of hemelytral length, reaching or surpassing apex of abdomen. PROPLEURON: punctate or not; prosternal carinae moderately to very strongly elevated and lobulate. MESOPLEURON: nearly flat; evaporatorium restricted (Fig. 106) or extending into postero-lateral angle of segment (Figs. 105, 107); mesosternum convex, more or less carinate and haired medially. METAPLEURON: convex; osteolar peritreme without modified terminal lobe (Figs. 106, 107); evaporatorium occupying mesal two-thirds or three-fourths of segment; lateral area with

few or no punctures. LEGS: moderately long; anterior tibia (Fig. 129) not surpassing tarsal insertion; posterior tibia (Fig. 150) terete, usually simple, in some males (chiefly in subgenus Pseudopangaeus) ventrally with subbasal emargination distad of which is a decided angle (Figs. 153, 155). STERNITES: polished or alutaceous, impunctate or with few punctures laterally; posterior margins of segments finely denticulate or crenulate. TERMINALIA: male genital capsule with apical rim entire or variously emarginate.

GENOTYPE: Signoret (loc. cit.) proposed Stenocoris monobasically for Aethus longulus Dallas (1851:119). Since that generic name had been used previously by Burmeister (loc. cit.) in the hemipterous family Coreidae and by Rambur (loc. cit.) in the hemipterous family Lygaeidae, Signoret's application of it was invalid. Bergroth (loc. cit.) recognized this and proposed for it the new name Dallasia. Unfortunately, this name was also preoccupied, this time by Stokes (loc. cit.) in Protozoa so it became necessary for Berg (loc. cit.) to propose yet another name, Dallasiellus, for Signoret's genus. Because both of these new names were proposed to replace Stenocoris of Signoret, they must both take Aethus longulus Dallas as genotype by objective synonymy. The genotype of Colobophrys Horvath (loc. cit.) is Colobophrys solitaria Horvath (1919:244) by original designation. The genotype of Geocnethus Horvath (loc. cit.) is the African species Geocnethus obesus Horvath (1919:248) by original designation. Although none of the species of the Western Hemisphere is congeneric with Geocnethus, this name enters American list because Horvath, in proposing it as new, assigned a number of American species to it. In this he has been followed by subsequent authors.

DISTRIBUTION: The range occupied by members of this genus extends from the states of Washington and Idaho in the north, south through Central America into South America as far as Argentina, and eastward in the Gulf States of the United States and into the West Indies.

DISCUSSION: Of all of the genera of Cydnidae occurring in the New World, this is the least satisfactorily defined. It is simply a "residual area" of relatively little specialization. It is a "dumping ground" to receive those species which do not fit into any of the more strongly marked genera which were previously separated in the key.

The reasons for synonymyzing the generic names of Stenocoris Signoret and Dallasia Bergroth were given above, both having been preoccupied.

Colobophrys Horvath is here relegated to synonymy because the genotype presents no features which the author considers to be of generic importance for separating it from Dallasiellus. In fact, Colobophrys is here considered to be the same as the nominal subgenus. Horvath had pointed out that he considered his genus to be close to Macroscytus to which it was related by the "marginatus pronoti postice abbreviatus." Actually this statement is misleading, not only to the reader, but also misled Horvath himself. In none of the specimens of Cydnidae examined by the author, not even Macroscytus, has there been any shortening of the lateral pronotal margins. In Macroscytus the posterior part of the lateral pronotal margin is evanescent and hidden from dorsal view by the laterally swollen umbones; but never-the-less, it does extend to the posterior margin of the segment. Horvath based Colobophrys on a new species, C. solitaria, which he described from a single female. Through the kind cooperation of Drs. Soos and Halaszfy, of the Musee d'Histoire Naturelle de la Hongrie,

this type was made available for study. In this type, as well as in other specimens of the species, the lateral pronotal margin is evanescent posteriorly but is visible for its full length because the umbones are not swollen laterally. The evanescence of the posterior part of the lateral margin results in the greatest pronotal width being distinctly antebasal. This latter situation also is evident in D. californicus and to a much lesser degree in the new species Dallasiellus puncticeps. Puncticeps and solitaria agree in one feature, the coarsely rugo-punctate cephalic punctation, which sets them apart from all other members of the genus. But surely this cannot be interpreted as being of generic value in any part of the Cydnidae because this extreme as well as the opposite and all intermediates occurs in many parts of the family. Horvath did not know the male of his lone species of Colobophrys so he was unable to point out the sexual dimorphism that occurs in solitaria. The males differ markedly from the females in possessing a peculiar, submedian emargination in the lateral pronotal margin. This emargination is marked by a peculiar "fold" which appears to send an oblique furrow mesally, as shown in the illustration of the male pronotum of D. americana (Fig. 78). If this pronotal "fold" is believed to have value as a generic indicator, these two species must be grouped together in one genus. But the present author cannot bring himself to agree with establishing genera in the Cydnidae on secondary sexual characters. He prefers to believe that the presently offered generic arrangement based primarily on modifications of the osteolar peritreme and secondarily on other features possessed by groups of species gives a truer picture of relationships than any other system offered. This arrangement has the additional merit of keeping to a minimum

the number of monobasic genera in this morphologically homogeneous family.

All American species of Dallasiellus differ from the type species of Geocnethus Horvath (G. obesus Horv.) in that the metapleural evaporatorium is complete, while in Geocnethus obesus it has an anterior, submarginal, polished band (suggestive of Rhytidoporus) extending laterally from the tip of a fold just anterior to the apex of the osteolar peritreme. All New World species that have been described in Geocnethus fit readily into Dallasiellus as here defined.

Dallasiellus contains three major groups of species that grade into each other by transitional combinations of structural details - thus preventing the establishment of full genera. To point out this grouping, the author has felt obligated to divide the genus into three subgenera which may be separated by the following key.

Key to the Subgenera of Dallasiellus

1. With the combination of very coarse, widely separated crenulations sublaterally on posterior margin of mesopleuron, and a transverse, submarginal, polished band interrupting mesopleural evaporatorium posteriorly (Fig. 106) (male hind tibia with strong, subbasal angulation on postero-ventral margin as in Fig. 148). . . . . .Pseudopangaeus n. sbg. p. 373

   Without the combination of coarse crenulations and posterior interruption mentioned above, usually with neither (male hind tibia never with subbasal ventral angulation). 2

2. Margin of jugum with fine, marginal carina dorsally from eye to apex . . . . . Dallasiellus p. 367

Margin of jugum thick, calloused, ecarinate or with partial carina (not reaching eyes) located submarginally. . . .

northern Mexico and eastward through New Mexico into western Texas and Oklahoma.

DISCUSSION: The transfer of Uhler's species discrepans from Pangaeus to its present position removes one of the enigmas in North American hemipterology. At the same time, the nearness of this subgenus to Pangaeus through discrepans is recognized. As was admitted in the generic discussion of Dallasiellus, this genus serves as a vehicle for the least strongly modified species of Western World Cydnidae. Since such is the case, one should not be surprised to find that some of the included species do resemble certain of the more strongly marked genera, even though they lack the unique separating modifications of those genera. The present subgenus, Pseudopangaeus, resembles the northern subgenus of Pangaeus, Boreopangaeus, in several interesting respects. First, it is somewhat northern in distribution, occurring mostly within the United States. Secondly, there are the following structural parallels: 1) several setigerous punctures on jugal submargins; 2) usually (except in D. californicus) with four or more costal setigerous punctures; 3) the mesopleural evaporatorium is restricted; 4) osteolar peritreme lacks a terminal differentiation, and its evaporatorium has lateral margin strongly concave. The modification of the hind legs (ventral tubercles on femora of both sexes, and the subbasal angulation on the tibia of the male) which form such a prominent character here is duplicated in Boreopangaeus in the new species Pangaeus setosus and tuberculipes. These several similarities suggest the possibility that the species of Pseudopangaeus actually belong with those of Pangaeus. Perhaps they do, perhaps they represent the still unmodified "ancestral stock" from which more specialized Pangaeus arose, or perhaps

they are an offshoot from Pangaeus. Regardless of the reason for the admitted closeness to Pangaeus, the addition of these species to that genus would create a major problem of defining and separating the genera in Group B of the subfamily Cydninae. As here treated, the species groups, whether at a generic level or a higher or lower level, can be recognized in a usable way—surely one of the principal aims of systematics is to produce an arrangement that is workable as well as "natural." The present author, therefore, chooses to recognize the sharply impressed, subapical line on the pronotum as being sufficiently diagnostic to separate Pangaeus from Dallasiellus in a practical way (but even this character is suggested by partial and vague lines or a sunken row of punctures in some individual specimens of Pseudopangaeus).

Key to the Species of Subgenus Pseudopangaeus

1. Corium distinctly alutaceous; peritreme abruptly terminated apically (as in Fig. 107). . . . . californicus (Blatch.) p. 376

   Corium polished; apex of peritreme fusing gradually into surrounding cuticula (Fig. 106). 2

2. Scutellum distinctly longer than wide; size smaller, length of body 6.7-8.2. 3

   Scutellum as wide or wider than long; size larger, length of body, 8.6-10. . . . . vanduzeei n. sp. p. 386

3. Pronotum laterally with abundant, close-set, intermixed coarse and fine punctures; mesocorium with many distinct punctures throughout and forming two complete rows paralleling claval suture. . . . . puncticoria n. sp. p. 383

Pronotum laterally with no fine punctures between the few, well-separated, coarse punctures; mesocorium with one complete but basal part of second row of punctures paralleling claval suture, discally impunctate or with few punctures near apex . . . . . discrepans (Uhl.) p.379

Dallasiellus (Pseudopangaeus) californicus (Blatchley)

1929 Pangaeus californicus Blatchley, Can. Ent., 40:74.

1939 Pangaeus californicus Torre Bueno, Ent. Amer., 19:180.

DIAGNOSIS: The finely but distinctly alutaceous surface of the corium sets this species apart from the others in the subgenus.

DESCRIPTION: MALE:- elongate-oval, widest immediately anterior to base of pronotum. HEAD: length two-thirds of width, 1.46 (1.38-1.56): 2.13 (1.97-2.34); interocular width, 1.30 (1.17-1.44); anterior margin approximately semicircular; juga a little longer than clypeus and contiguous beyond it; jugal surface moderately rugose on apical half, minutely punctured anterior to ocelli, with three or four widely separated, submarginal setigerous punctures; juga ventrally polished; maxillary plate alutaceous, with few weak punctures toward base; antennals, I, 0.46 (0.43-0.50): II, 0.68 (0.66-0.71): III, 0.62 (0.59-0.68): IV, 0.94 (0.90-1.00): V, 1.00 (0.94-1.05); bucculae about as high as labial II; labials, I, 0.71 (0.70-0.73): II, 1.25 (1.16-1.35): III, 1.11 (1.03-1.20): IV, 0.61 (0.60-0.63). PRONOTUM: length more than half width, 2.75 (2.40-3.00): 5.08 (4.61-5.53); anterior margin broadly and rather shallowly emarginate; side margin entire, narrowing from base or from immediately anterior to base, with submarginal row of seven or eight setigerous punctures; transverse impression obsolete

to absent, submedian, marked by a broad band of moderate punctures; remainder of surface virtually impunctate except for several punctures on middle of posterior lobe. SCUTELLUM: longer than wide, 3.39 (3.02-3.70): 3.13 (2.83-3.60); surface shining to faintly alutaceous, with several irregularly scattered punctures discally. HEMELYTRON: corium and clavus alutaceous; former with distinct punctures restricted to a single complete row paralleling claval suture and basal third of a second row; clavus with a single longitudinal row of punctures becoming evanescent posteriorly; costa with none to three setigerous punctures; membranal suture faintly sinuate near lateral angle, latter slightly acute. PROPLEURON: depression with numerous coarse, close-set punctures ventrally; prosternal carinae low, blunt. MESOPLEURON: as described for genus. METAPLEURON: peritreme abruptly terminated apically (as in Fig. 107); evaporatorium with lateral edge slightly concave; lateral shining area tumid, impunctate or with a few moderate punctures. STERNITES: impunctate, alutaceous; sutures finely crenulate. LEGS: long; posterior tibia gently curved, with prominent angulation at basal fourth of postero-ventral margin, emargination basad of this finely crenulate. TERMINALIA: genital capsule with apical margin slightly emarginate medially, surface punctured along base and apex; gonostylus as illustrated (Fig. 260). LENGTH of body, 9.62 (8.58-10.46).

FEMALE:- similar to males except for generally fewer pronotal punctures and the absence of the tibial modification described above. HEAD: length: width:: 1.45 (1.43-1.49): 2.08 (2.02-2.17); interocular width, 1.25 (1.22-1.31); antennals, I, 0.50 (0.47-0.56): II, 0.68 (0.64-0.76): III, 0.63 (0.60-0.68): IV, 0.91 (0.86-1.00): V, 0.97 (0.93-1.03); labials, I, 0.78 (0.71-0.90): II, 1.30 (1.30-1.33): III, 1.06 (0.98-1.13): IV, 0.64

(0.61-0.70). PRONOTUM: length: width:: 2.78 (2.68-3.00): 5.03 (4.79-5.42). SCUTELLUM: length: width:: 3.41 (3.17-3.88): 3.00 (2.74-3.45). LENGTH of body, 9.40 (8.78-10.21).

TYPE DATA: The type female now in the W. S. Blatchley collection at the University of Indiana, was listed as coming from "near Sunland, Los Angeles County, California," Blatchley (1929:74).

DISTRIBUTION: This species is restricted to the southwestern United States where it is known from Texas, New Mexico, Arizona and California.

DISCUSSION: A paratype (labelled Cold Water Canyon, Los Angeles Co., Cal., X-4, 1908) from the collection of the California Academy of Sciences was kindly lent for study by Dr. E. R. Ross. In describing this species as new, Blatchley pointed out its nearness to Uhler's "Pangaeus discrepans" and suggested that these two forms differed from other true Pangaeus in lacking the subapical impressed line on the pronotum.

Ecological data consisted of the lone collection note given with the original description, "from beneath a stone in a small semi-desert area."

SPECIMENS STUDIED: 20 males, 38 females. UNITED STATES: Arizona: Antelope Park (Vavapari Co.), Chiricahua M., Continental, Devoe, Globe, Hackberry, Hualpai M., Kit's Peak (4050', Baboquivari Mts.), Sabino Basin (St. Catalina Mts.), S. Rita Mts., Thatcher, Tucson; May to September. California: Cold Water Canyon (Los Angeles Co.), Pamona, Pinon Flat (San Jacinto Mts.), Sequoia Nat. Pk. (Ash Mt. Rd., Potwisha, Wolverton), "So. California;" March to October. New Mexico: Las Cruces, Masilla Park, Rodeo; March, June, July. Texas: Boquillas, Terlingua; May, July. MEXICO: Lower California: Van Nuys; April.

Dallasiellus (Pseudopangaeus) discrepans (Uhler) NEW COMBINATION

1877 Pangaeus discrepans Uhler, Bull. United States Geol. Geog. Surv., 3:386.

1880 Pangaeus discrepans Distant, Biol. Centr.-Amer., Rhynch., 1:7, pl. 2, fig. 19.

1882 Pangaeus discrepans Signoret, Ann. Soc. Ent. France, (6) 2:249, pl. 8, fig. 109.

1886 Pangaeus discrepans Uhler, Checklist Hemip. N. Am., p. 3.

1893 Pangaeus discrepans Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1910 Pangaeus discrepans Banks, Catal. Nearct. Hemip., p. 100.

1917 Pangaeus discrepans Van Duzee, Univ. California Pubs. Ent., 2:21.

1939 Pangaeus discrepans Torre Bueno, Ent. Amer., 19:180.

DIAGNOSIS: This species may be separated from its related species by the elongate scutellum and the polished mesocorium, which is virtually impunctate on the apical half or more, coupled with its smaller size, 6.8-8.2.

DESCRIPTION: MALE:- oval, widest behind the middle. HEAD: length about two-thirds of width, 1.25 (1.24-1.26): 1.83 (1.71-1.91); interocular width, 1.22 (1.16-1.26); anterior margin a broad semicircle, sometimes slightly truncated apically; juga as long as clypeus or slightly longer and nearly or quite meeting anterior to it; surface with several radiating, moderate rugae and numerous minute punctures; ocelli very small, separated from eye by a space equalling about four times transverse ocellar diameter; jugum ventrally polished, impunctate; maxillary plate faintly alutaceous, with few or no punctures; antennals, I, 0.41 (0.40-0.43): II, 0.49 (0.46-0.53): III, 0.47 (0.43-0.50): IV, 0.64 (0.60-0.70): V, 0.65 (0.60-0.70); bucculae about as high as labial II; labials, I; 0.64 (0.60-0.67): II, 1.00 (0.96-1.06): III, 0.84 (0.76-0.90): IV, 0.51 (0.47-0.54). PRONOTUM: length more than half of width, 2.13 (1.89-2.28): 3.92 (3.57-4.16); anterior margin

deeply and simply emarginate; side margins entire, narrowing from just in front of base, with submarginal row of fourteen to seventeen setigerous punctures; transverse impression obsolete to absent, marked by a very irregular band of moderate punctures; anterior lobe with anterior submargin sometimes vaguely impressed, with a row of irregularly spaced punctures, laterally with numerous close-set punctures; posterior lobe impunctate except for few punctures in middle and several in antero-lateral angles. SCUTELLUM: longer than wide, 2.65 (2.37-2.79): 2.28 (2.08-2.47); disc polished, with few, mostly wide scattered, sunken punctures becoming finer toward apex. HEMELYTRON: corium and clavus polished; corium usually with one complete and the basal part of a second row of punctures paralleling claval suture, most of exocorial length and basal angle and often apex of mesocorium also variously punctured; clavus with a single, longitudinal row of punctures extending more than half way to apex; costa with five to eight setigerous punctures; membranal suture straight, lateral angle almost rectangular; membrane reaching or very slightly surpassing apex of abdomen. PROPLEURON: impunctate; prosternal carinae low, acute. MESO- and METAPLEURON: as described for subgenus, apex of peritreme fusing with surrounding cuticula; lateral edge of evaporatorium deeply concave (Fig. 106); lateral polished area slightly convex, with several weak, longitudinal rugae. STERNITES: polished, roughened laterally by numerous fine, longitudinal rugae; sutures finely crenulate. LEGS: moderately long, posterior pair modified as in subgeneric description (Fig. 148). TERMINALIA: genital capsule with distinct, shallow emargination at middle of apical margin, surface with numerous punctures either side of polished midline; gonostylus as illustrated (Fig. 261). LENGTH of body, 7.57 (6.83-7.94).

FEMALE:- similar to male, usually with fewer pronotal and scutellar punctures and never with modification of posterior legs that occurs in males. HEAD: length: width:: 1.30 (1.26-1.39): 1.84 (1.76-1.99); interocular width, 1.19 (1.15-1.26); antennals, I, 0.39 (0.37-0.43): II, 0.49 (0.46-0.56): III, 0.48 (0.43-0.56): IV, 0.60 (0.46-0.68): V, 0.65 (0.56-0.71); labials, I, 0.66 (0.62-0.70): II, 1.05 (0.96-1.16): III, 0.89 (0.76-1.03): IV, 0.54 (0.50-0.60). PRONOTUM: length: width:: 2.11 (1.95-2.28): 3.97 (3.78-4.36). SCUTELLUM: length: width:: 2.70 (2.53-2.86): 2.44 (2.34-2.60). LENGTH of body, 7.70 (7.37-8.25).

TYPE DATA: The types, now in United States National Museum collections, were collected "From near Fort Cobb, Indian Territory, by Dr. George H. Horn, and near San Diego, Cal., by William Holden," Uhler (loc. cit.).

DISTRIBUTION: Discrepans ranges west of the Rocky Mountains from Washington and Idaho south to California and Arizona thence eastward through New Mexico into Texas and the western-most county of Oklahoma. One specimen from Philadelphia is commented upon below.

DISCUSSION: The original combination of names of this species has been the most abused of all the names in the family in the Western Hemisphere. It has been found affixed to no less than seven species in four genera. What has been the real cause of this confusion is not apparent. True, Uhler's assigning it to Pangaeus was misleading, but the original description is complete enough to preclude many of the assignments that have been made. It is hoped, however, that the present treatment will correct and simplify the determination of specimens of this species.

The relation of discrepans to the new species puncticoria is not yet clear to the author. Puncticoria appears to share the southern half of

California with discrepans and then range southward into Lower California. Unfortunately, the latter territory is represented by a single pair of somewhat atypical specimens which are somewhat suggestive of discrepans in having fewer mesocorial punctures than do most specimens of puncticoria from California proper. A goodly series of puncticoria, some fifty-four specimens, was at hand from Sequoia National Park, California; this series with one or two exceptions was easily separated from discrepans by abundant mesocorial punctures. The few exceptions were quite similar to the two from Lower California and suggested that these forms belonged together. Perhaps when more intensive collecting is done with this problem in mind, puncticoria will be found to be but a localized variant of discrepans and so deserve no more than subspecies status. Unfortunately, the internal male genitalia of these two species and vanduzeei are all very similar and offer no help in the problem--unless one wishes to accept them as evidence that the present treatment is simply unnecessary splitting of what is but one species.

A single female labelled "Phila., Pa., 30 May, 20, J. C. Lutz," is in the Lutz collection. This locality of capture is far removed from the continuous range of discrepans as indicated in the distributional data given above. In reply to a query concerning this specimen, Mr. Lutz wrote that according to his field notes, "This specimen was found in its normal habitat, under a log in Morris Park, Phila." With doubt about the authenticity of this capture removed, one is at a loss to explain its appearance at such a distance from its native haunts. The most likely explanation that occurred to the author was that it had been carried into that area in soil around plant roots, possibly nursery stock. Additional collecting in that area

might determine whether or not the species has become established.

SPECIMENS STUDIED: 37 males, 41 females. UNITED STATES: Arizona: Buckeye, Douglas, Flagstaff, Grand Canyon (south rim, Roaring Springs), Huachuca Mts., Oracle, Palmerlee, Pepper Sauce Cn. (Sta. Catalina Mts.), Pinal Mts. (base), Ramah, Roosevelt Lake, San Carlos Lake; March to August. California: Claremont, Laguna Beach, Los Angeles Co., Mohave, San Diego, Santa Paula; May to July. Colorado: Boulder, Ft. Collins; April. Idaho: Coeur d'Alene Lake, Lewiston; May, July. New Mexico: Jemez; April, June, August. Oklahoma: Kenton; July. Oregon: Dalles, Malheur Co., Monroe, Ochocho Dam; June, September. Pennsylvania: Philadelphia; May (see discussion concerning this specimen). Texas: "Tex." Utah: Salt Lake City; July. Washington: Asotin, Pullman, Tampico, Walla Walla, Wawawai; May to October.

Dallasiellus (Pseudopangaeus) puncticoria NEW SPECIES

DIAGNOSIS: The presence of numerous distinct punctures occurring uniformly over the mesocorium will separate this species from all others in the subgenus.

DESCRIPTION: MALE:- oval, widest behind the middle. HEAD: length about two-thirds of width, 1.17 (1.17-1.20): 1.71 (1.63-1.86); interocular width, 1.18 (1.13-1.26); anterior margin broadly semicircular, slightly flattened apically; juga slightly longer than clypeus, convergent and contiguous beyond latter; surface with several radiating, moderate rugae and numerous minute punctures; ocelli minute, separated from eye by a space equalling about five times a transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate impunctate except along basal margin;

antennals, I, 0.35 (0.34-0.37): II, 0.45 (0.45-0.47): III, 0.42 (0.40-0.44): IV, 0.59 (0.56-0.62): V, 0.62 (0.61-0.63); bucculae about as high as labial II; labials, I, 0.58 (0.57-0.60): II, 0.87 (0.83-0.90): III, 0.74 (0.70-0.79): IV, 0.46 (0.44-0.47). PRONOTUM: length little more than half width, 1.92 (1.86-2.02); 3.76 (3.64-3.84); anterior margin deeply, simply concave; side margins entire, narrowing from just in front of base, submarginal row of thirteen to seventeen setigerous punctures; transverse impression obsolete to absent, marked by irregular band of punctures; latter very sparse at middle and close-set laterally; anterior lobe and anterior part of posterior lobe densely punctate laterally, denser punctures usually with numerous minute punctures between. SCUTELLUM: longer than wide, 2.60 (2.49-2.60): 2.28 (2.21-2.34); disc polished, usually with numerous crowded moderate punctures and minute ones in between. HEMELYTRON: corium and clavus polished; exocorium and mexocorium with numerous punctures distributed for full length, mesocorium with two complete rows of punctures paralleling claval suture, clavus with several smaller punctures in addition to usual longitudinal row; costa with four to seven setigerous punctures; membranal suture virtually straight; membrane reaching or slightly surpassing apex of abdomen. PROPLEURON: alutaceous, punctate ventrally; prosternal carinae low, acute. MESOPLEURON: as described for subgenus. METAPLEURON: as in discrepans (Fig. 106), apex of peritreme fusing with surrounding cuticula; lateral edge of evaporatorium deeply concave; lateral polished area weakly convex, with few punctures. STERNITES: shining, very weakly alutaceous, with numerous scattered, very fine punctures; sutures finely crenulate. LEGS: moderately long, posterior pair modified as in subgeneric description (Fig. 148). TERMINALIA: apical margin of genital capsule faintly emarginate

medially, midline with few fine punctures, laterally with crowded prominent punctures; gonostylus as illustrated (Fig. 262). LENGTH of body, 7.12 (6.78-7.34).

FEMALE:- similar to male, lacking modification of posterior legs. HEAD: length: width:: 1.16 (1.06-1.23): 1.65 (1.60-1.74); interocular width, 1.16 (1.12-1.23); antennals, I, 0.36 (0.33-0.40): II, 0.51 (0.38-0.44): III, 0.42 (0.40-0.46): IV, 0.56 (0.53-0.60): V, 0.45 (0.43-0.48); labials, I, 0.55 (0.53-0.60): II, 0.88 (0.86-0.94): III, 0.70 (0.68-0.72): IV, 0.45 (0.43-0.48). PRONOTUM: length: width:: 1.92 (1.73-2.08): 3.60 (3.45-3.80). SCUTELLUM: length: width:: 2.52 (2.35-2.69): 2.16 (2.08-2.28). LENGTH of body, 6.83 (6.57-7.19).

TYPE DATA: HOLOTYPE male and ALLOTYPE female both in the collection of the California Academy of Sciences and labelled "Potwisha, Sequoia Natl. Park, Calif., 3,000-5,000 ft., V-8-31, E. C. VanDyke collector." PARATYPES: UNITED STATES: California: same data as holo- and allotype, 3m, 5f (CalAc, RCF). Sequoia Natl. Park, Potwisha, 2,000-5,000 ft., E. C. VanDyke (CalAc) (for all five dates following) V-20-30, 3m, 4f; May 24, 1929, 1f; June 2, 1929, 2m; June 13, 1929, 3f; June 20, 1929, 2m; VII-16, 1931, 11f. Sequoia Natl. Park, Wolverten, 7,000-9,000 ft., E. C. VanDyke, 2f. Sequoia Natl. Park, 2,000-3,000 ft., IV-24, 1946, R. C. Bechter, 1m, 1f (McC). Sequoia Natl. Park, V-24, 25, 26, 1929, 1m, 4f (RLU). Seqouia Natl. Park, V-19-30, 1m (RLU). Seqouia Natl. Park, 3,000-7,000 ft., V-27, 1929, 2f (CIS). Seqouia Natl. Park, 2,000-2,000 ft., VI-13, 1929, 1f (CIS). So. Calif., 3m, 2f (RLU). Altadena, Los Angeles Co., Mch. 11, 1912, J. C. Bridwell, 2m (USNM). Playa del Roy, Los Angeles Co., V-20-38, A. T. McClay, 1f (McC). Claremont, 8-28, 1m (RLU). MEXICO: Lower California: Hamilton Ranch,

VIII-2, 38, Michelbacher & Ross, 2f (CalAc).

DISCUSSION: Although treated as a valid new species here, this form may prove, with more specimens from the southern half of California, to merge into discrepans. If this happens it will have to fall into synonymy, but for the present it is probably better to have the differences between the two brought forcibly to the attention of collectors who can solve the problem in the field or possibly by breeding the two forms.

Dallasiellus (Pseudopangaeus) vanduzeei NEW SPECIES

DIAGNOSIS: The large size and polished corium permits ready recognition of this species within its subgenus, as does the broad scutellum which is as wide or wider than long.

DESCRIPTION: MALE:- oval, widest behind the middle. HEAD: length about three-fourths width, 1.55 (1.53-1.56): 2.15 (2.10-2.20); interocular width, 1.44 (1.43-1.47); anterior margin a broad, slightly flattened semicircle; juga as long as clypeus, strongly narrowing latter at apex; jugal surface with strong, radiating rugae and numerous minute punctures; jugum ventrally and maxillary plate impunctate; antennals, I, 0.49 (0.46-0.53): II, 0.63 (0.62-0.64): III, 0.62 (0.61-0.63): IV, 0.81 (0.80-0.84): V, 0.78 (0.76-0.80); bucculae about as high as labial II; labials, I, 0.75 (0.73-0.78): II, 1.32 (1.30-1.37): III, 1.16 (1.13-1.23): IV, 0.68 (0.67-0.70). PRONOTUM: length more than half width, 2.89 (2.84-3.02): 5.22 (4.97-5.40); anterior margin rather deeply and simply emarginate; side margins entire, narrowing from just anterior to base, with submarginal row of fourteen setigerous punctures; transverse impression obsolete to absent, marked by an irregular band of widely separated punctures; remainder of surface

virtually impunctate except for numerous close-set punctures laterally on anterior lobe. SCUTELLUM: wider than long, 3.42 (3.27-3.60): 3.31 (3.15-3.45); surface polished, discally with several coarse, often sunken punctures, irregularly spaced. HEMELYTRON: corium and clavus polished; former usually with distinct punctures restricted to one complete and the basal part of a second row paralleling claval suture, some specimens with several distinct punctures at apex of exocorium; clavus impunctate or with few punctures near base; costa with five to seven setigerous punctures; membranal suture nearly straight, lateral angle slightly acute; membrane slightly surpassing apex of abdomen. PROPLEURON: depression punctate ventrally; prosternal carinae very low, acute. MESOPLEURON: as described for genus. METAPLEURON: as in discrepans (Fig. 106), peritreme apically fusing with surrounding cuticula; lateral edge of evaporatorium deeply concave; lateral polished area faintly convex, with several obsolete, longitudinal rugae. STERNITES: polished, impunctate; suture finely crenulate. LEGS: moderately long; posterior tibia gently curved, with prominent angulation at basal fourth of postero-ventral margin, emargination basad of this finely crenulate. TERMINALIA: genital capsule with apical margin slightly emarginate medially; surface with numerous punctures on lateral thirds; gonostylus as illustrated (Fig. 263). LENGTH of body, 9.30 (8.69-9.95).

FEMALE:- similar to male, usually with fewer pronotal punctures and never with the modification of the posterior tibia that occurs in the males of all species in this subgenus. HEAD: length: width:: 1.53 (1.49-1.57): 2.13 (2.08-2.18); interocular width, 1.40 (1.36-1.47); antennals, I, 0.51 (0.50-0.53): II, 0.62 (0.60-0.66): III, 0.57 (0.53-0.60): IV, 0.78 (0.76-0.80): V, 0.78 (0.75-0.83); labials, I, 0.77 (0.76-0.80): II, 1.30 (1.26-1.35): III,

1.13 (1.10-1.23): IV, 0.69 (0.68-0.70). PRONOTUM: length: width:: 2.84 (2.80-2.89): 5.12 (5.10-5.20). SCUTELLUM: width: length:: 3.33 (3.28-3.45): 3.30 (3.18-3.43). LENGTH of body, 9.25 (8.89-9.45).

TYPE DATA: HOLOTYPE: male, "Austin, Texas," with the label, "Pangaeus discrepans" and VanDuzee's label, "does not agree." ALLOTYPE: female, "Austin, Tex., C. T.Brues," Both the holotype and the allotype are in the collection of the United States National Museum. PARATYPES: nine of the eleven paratypes had come from Austin, Texas. Additional data on these were as follows: same data as allotype, 1m, 1f (RCF); 3-2-00, A. L. Melander, labelled Pangaeus ? margo, 1m (HMH); 23-11-00, 1m (USNM); labelled Pangaeus discrepans Uhl. ?, 1m (USNM); 3-11-45, Martin Polhemus, 2f (HMH). The other two paratypes were labelled as follows: Tex., 2-23-00, Bueno, Van Duzee Collection, 1m (CalAc). El Centro, Cal., VII-8, '27, G. Linsley Coll., 1f (RLU).

DISTRIBUTION: The type data given above indicate that this species occurs from Texas west into southern California.

DISCUSSION: In general appearance, members of this species appear to be simply large-sized individuals of discrepans, but can be separated readily therefrom by the broader scutellum.

Subgenus Ecarinoceps NEW SUBGENUS

DIAGNOSIS: The lack of a fine, marginal carina dorsally on the juga enables one to recognize species of this subgenus from those in the other two subgenera.

DESCRIPTION: agreeing with the generic description except for the following modifications: HEAD: juga dorsally without fine carina marginally,

margin thickened, usually calloused, sometimes with a submarginal line, in all species (except megalocephalus) with one submarginal setigerous puncture; labial length variable from between middle of mesosternum to sternite IV. MESOPLEURON: evaporatorium extensive, extending along posterior margin of segment into postero-lateral angle; posterior margin with crenulations finer and closer set than in subgenus Pseudopangaeus (see Fig. 106 for latter). LEGS: posterior tibia of both sexes simple; femora not tuberculate ventrally.

SUBGENOTYPE: Aethus americanus Stal (1860:12), here designated.

DISTRIBUTION: Specimens at hand indicated the range of this subgenus as southern, extending from Mexico south through Central America into northern Brazil and eastward into the West Indies, with a single specimen labelled from Florida.

DISCUSSION: The form of the jugal margin seen in the members of this subgenus appears to be unique within the American forms of the subfamily Cydninae. In most species the juga have a fine but distinct dorsal carina at the very margin of the head. In the Ecarinoceps, however, such a carina is either lacking or distinctly submarginal and incomplete when the head is viewed at right angles to its dorsal surface. This feature is easily interpreted in all included species.

Key to the Species of Subgenus Ecarinoceps

1. Mesopleural evaporatorium reaching to lateral margin of segment. . . . 2
   Mesopleural evaporatorium not attaining lateral margin of segment (Fig. 105). 6
2. Labium very long, reaching to sternite IV; anterior convexity of propleuron with numerous, close-set, moderate punctures. . . . . longirostris n. sp. p. 399

Labium shorter, not surpassing middle coxae; anterior convexity of propleuron mostly impunctate. 3

3. Costa with one setigerous puncture 4

Costa with two setigerous punctures. 5

4. Head across eyes more than half pronotal width, anterior outline broadly rounded or semicircular (Fig. 62). megalocephalus n.sp. p. 402

Head across eyes less than half pronotal width. . . .laevis n.sp. p. 397

5. Bucculae higher than labial II, abruptly terminated posteriorly (as in Fig. 23); size larger, length of body, 8.2-8.8. . . . . reflexus n.sp. p. 404

Bucculae lower than labial II, evanescent posteriorly; smaller, length of body, 6.0-6.7. . . . . insulensis n.sp. p. 395

6. Jugum with one submarginal setigerous puncture immediately anterior to eye; mesocorium in great part impunctate. . . . . americanus (Stal) p. 390

Jugum with three submarginal setigerous punctures; mesocorium with abundant punctation over all of surface. . foratus (Sign.) p. 393

Dallasiellus (Ecarinoceps) americanus (Stal) NEW COMBINATION

1860 Aethus americanus Stal, Svenska Vet.-Ak. Handl., 2(7):12.

1867 Aethus americanus Walker, Catal. Hemip. British Mus., 1:152.

1876 Macroscytus americanus Stal, Svenska Vet.-Ak. Handl., 14(4):19.

1883 Geotomus americanus Signoret, Ann. Soc. Ent. France, (6) 3:34, pl. 2, fig. 143.

1893 Geotomus americanus Lethierry and Severin, Gen. Catal. Hemip., 1:72.

DIAGNOSIS: The peculiar shape of the mesopleural evaporatorium which extends into the postero-lateral angle of the segment but does not reach all the way to the side margin (Fig. 105) coupled with presence of a single submarginal setigerous puncture on the jugum will identify this species within the subgenus.

DESCRIPTION: (From two incomplete males and two females) MALE:- elongate-oval. HEAD: length two-thirds of width, 1.01 (1.00-1.03): 1.56 (1.56-1.56); interocular width, 0.86 (0.86-0.87); anterior outline semi-circular, clypeus as long as juga, slightly narrowed apically; surface slightly convex, impunctate, with one submarginal setigerous puncture in front of eye; ocelli small, on line connecting hind margins of eyes, removed from eyes by about one transverse ocellar width; jugum ventrally and maxillary plate (except at base) polished, impunctate; antennals (all segments missing but I-III on one specimen), I, 0.33: II, 0.43; III, 0.46; bucculae about as high as labial II, decurved posteriorly; labium reaching between middle coxae, segments, I, 0.51 (0.50-0.53): II, 0.88 (0.83-0.93): III, 0.68 (0.66-0.71): IV, 0.51 (0.51-0.51). PRONOTUM: length about half of width, 1.71 (1.70-1.71): 3.52 (3.52-3.53); anterior margin concave; side margins concave opposite ends of obsolete, median transverse impression due to a peculiar "fold" in margin (Fig. 78); pronotum virtually impunctate except for rows paralleling anterior margin and marking site of transverse impression and a patch laterally on the anterior lobe. SCUTELLUM: longer than broad, 2.50 (2.47-2.53): 2.07 (2.02-2.12); disc shining, with few small punctures scattered on basal half. HEMELYTRON: corium and clavus finely and almost imperceptibly (X30) alutaceous, impunctate except for one complete and one partial row paralleling claval suture and one

longitudinal row on clavus; costa with one or two setigerous punctures; membranal suture weakly bisinuate, lateral angle prolonged, acute; membrane subquadrate, reaching to apex of abdomen. PROPLEURON: polished, with distinct punctures only in depression; prosternal carinae low, narrow. MESOPLEURON: evaporatorium large, occupying all but narrow, polished, impunctate area laterally (Fig. 105). METAPLEURON: evaporatorium large, lateral margin gently convex; polished area impunctate. STERNITES: shining, impunctate. LEGS: moderately long. TERMINALIA: apical margin of genital capsule slightly sinuate, not flared, surface impunctate; gonostylus as illustrated (Fig. 264). LENGTH of body, 7.20 (6.90-7.20).

FEMALE:- similar to male but without "fold" in side margin of pronotum and scutellum with more numerous punctures extending onto apical half. HEAD: length: width:: 1.13 (1.10-1.16): 1.69 (1.69-1.70); interocular width, 0.95 (0.93-0.98); antennals, I, 0.38 (0.36-0.40): II, 0.44 (0.43-0.46): III, 0.49 (0.46-0.53): IV, 0.64 (0.63-0.65): V, 0.80 (0.80-0.80); labials, 0.60 (0.60-0.60): II, 1.03 (1.03-1.03): III, 0.74 (0.73-0.76): IV, 0.58 (0.56-0.60). PRONOTUM: length: width:: 1.88 (1.82-1.95): 3.64 (3.63-3.66). SCUTELLUM: length: width:: 2.76 (2.66-2.86): 2.23 (2.18-2.28). LENGTH of body, 7.11 (7.02-7.20).

TYPE DATA: The type male in the Naturhistoriska Riksmuseum in Stockholm, Sweden, is labelled "Rio," and was reported by Stal (loc. cit.) to have come from "Rio Janeiro," Brazil.

DISTRIBUTION: The four specimens studied were from the states of Rio de Janeiro and Santa Caterina in southern Brazil.

DISCUSSION: The type specimen was available for study through the kindness of Dr. Rene Malaise, and proved to be in an excellent state of

preservation, lacking only antennals II-V on one side and IV and V on the other.

The peculiar "fold" which occurs in the side margin of male pronotum appears in only one other known species of cydnid, Dallasiellus solitarius (Horvath). The biological significance on this structure is not apparent and as a taxonomic character it appears to be of no more than specific worth as americanus and solitarius are not especially closely related, other than generically, on other features.

Dallasiellus (Ecarinoceps) foratus (Signoret) NEW COMBINATION

1883 Geotomus foratus Signoret, Ann. Soc. Ent. France, (6) 3:38, pl. 2, fig. 146.

1893 Geotomus foratus Lethierry and Severin, Gen. Catal. Hemip., 1:72.

DIAGNOSIS: In the absence of specimens for study, the placement and diagnostic features were drawn from the original description and illustration. Within the subgenus Ecarinoceps, foratus may be recognized by the presence of three submarginal setigerous punctures on each jugum combined with the fact that the mesopleural evaporatorium extends into the postero-lateral angle of the segment but does not attain the lateral margin.

DESCRIPTION: Because there were no specimens available for redescribing this species, the original description is here copied:

> Amazones.—Long. 6 mill., larg. 3 mill. (Coll. Buchanan White.)
>
> D'un noir brun foncé, le rostre, les tarses, les antennes d'un brun jaune, le premier article de ces dernières jaune.
>
> Tete arrondie, les lobes latéraux plus longs que les medians, se touchant presque au delà et offrant trois cils sur les bords, dont un très près des yeux et les deux autres espacés au milieu de la distance de ce dernier au lobe médian. Vertex peu ponctúe. Rostre atteignant le sommet des hanches intermédiaires; le premier article plus long que le troisième. Prothorax offrant une très forte ponctuation, très brillant, avec quatre ou cinq cils sur les

bords latéraux; derrière le bord antérieur une ligne transverse de forts points entre les deux points piligères sous-ocellaires; sur les côtés latéraux et sur l'impression transverse de forts points bien détachés. Écusson avec l'extrémité subarrondie, une forte ligne de points de chaque côté et le disque fortement ponctue. Élytres fortement ponctuées, excepte sur la corie, où la ponctuation est obsolète; la côté marginale est très forte jusqu'au millieu, à peine visible ensuite et offrant deux points piligères vers la base. Membrane d'un jaune hyalin, dépassant d'un quart l'abdomen; celui-ci lisse, très brillant. Plaque mésosternale arrondie en avant, faiblement striée, avec une forte ligne audessus de la suture; quelques points sur la partie lisse en dessus. Plaque métasternale presque droite sur les côtés, avec quelques stries. Canal ostiolaire finissant par un lobe arrondi subéléve, avec une dent dans l'échancrure. Dans l'espace postmétasternal une forte ligne de points limitant les hanches postérieures. A la base de chaque segment, une ligne ponctuée-crenélée.

TYPE DATA: The present whereabouts of the type which originally came from "Amazones" has not been determined.

DISCUSSION: When Signoret's species of Cydnidae are established on the basis of his descriptions and illustrations rather than from the types, they should not be accepted too confidently. Signoret's "Revision" is exasperatingly unreliable. But in the absence of contrary data, the taxonomist is required to follow published information. Signoret's description and illustration furnish enough data to assign this species to the subgenus Ecarinoceps. The illustration of the mesopleural evaporatorium extending into the postero-lateral angle of the segment but not attaining the lateral margin of the segment allies foratus to americanus. In fact, the sketch of that structure is more accurate for americanus than is the sketch (loc. cit., fig. 143) labelled americanus. But the enlarged view of the head of foratus showing three submarginal setigerous punctures on each jugum and the abundant corial punctation prevents the uniting of foratus and americanus.

SPECIMENS STUDIED: none.

Dallasiellus (Ecarinoceps) insulensis NEW SPECIES

DIAGNOSIS: Three characters are needed to set this species apart from the others in the subgenus: 1) mesopleural evaporatorium reaching to side margin of segment; 2) costa with two setigerous punctures; and 3) bucculae low and evanescent posteriorly.

DESCRIPTION: MALE:- oval, width greatest just anterior to midlength. HEAD: (Fig. 45) length less than two-thirds of width, 0.96 (0.90-1.05): 1.52 (1.38-1.63); interocular width, 0.83 (0.78-0.87); anterior outline a broad, sometimes slightly flattened semicircle; juga as long as clypeus, latter very slightly narrowed toward apex; a single, submarginal setigerous puncture next to eye; surface impunctate, with broad, shallow, longitudinal depression on juga; ocelli large, separated from eye by space less than transverse ocellar width; jugum ventrally and maxillary plate (except along bucculae) shining, impunctate; antennals, I, 0.28 (0.25-0.30): II, 0.43 (0.40-0.49): III, 0.39 (0.33-0.43): IV, 0.52 (0.50-0.56): V, 0.63 (0.60-0.70); bucculae lower than labial II, evanescent posteriorly; labium attaining middle coxae, segments, I, 0.44 (0.38-0.50): II, 0.81 (0.76-0.86): III, 0.61 (0.56-0.66): IV, 0.46 (0.43-0.50). PRONOTUM: length about twice width, 1.54 (1.36-1.62): 3.14 (2.78-3.41); anterior margin shallowly concave; side margins entire, without "fold," submarginal row of six setigerous punctures; transverse impression post median, weak to obsolete, marked by single, medially interrupted row of punctures; remainder of surface impunctate except for row of punctures paralleling anterior emargination, a few toward sides and usually several in middle of posterior lobe. SCUTELLUM: longer than wide, 2.32 (2.18-2.43): 1.90 (1.69-2.02); surface shining, with numerous punctures on disc, impunctate on base and apex.

HEMELYTRON: corium and clavus finely but distinctly alutaceous; exocorium and all of mesocorium, except two rows paralleling claval suture, impunctate; clavus with a longitudinal row of punctures and a few laterad of this basally; costa with two setigerous punctures; membranal faintly bisinuate, lateral angle somewhat acute; membrane distinctly longer than basal width, slightly surpassing apex of abdomen. PROPLEURON: shining, punctate in depression and anterior to base of acetabulum; prosternal carinae low, acute, truncated ventrally. MESOPLEURON: evaporatorium reaching side margin of segment; lateral area impunctate, with few coarse rugae. METAPLEURON: lateral margin of evaporatorium oblique, slightly concave; lateral area impunctate. STERNITES: polished, impunctate. LEGS: moderately long. TERMINALIA: apical margin of genital capsule with a very shallow, broad V-shaped emargination, surface impunctate except at lateral angles; gonostylus as illustrated (Fig. 265). LENGTH of body, 6.34 (5.86-6.66).

FEMALE: very similar to male. HEAD: length: width:: 0.98 (0.94-1.02): 1.55 (1.46-1.60); interocular width, 0.87 (0.85-0.90); antennals, I, 0.29 (0.28-0.30): II, 0.44 (0.40-0.48): III, 0.39 (0.33-0.44): IV, 0.52 (0.46-0.56): V, 0.63 (0.60-0.70); labials, I, 0.46 (0.41-0.50): II, 0.81 (0.74-0.86): III, 0.64 (0.60-0.69): IV, 0.47 (0.44-0.50). PRONOTUM: length: width:: 1.56 (1.49-1.62): 3.19 (3.07-3.30). SCUTELLUM: length: width:: 2.36 (2.24-2.42): 1.96 (1.89-2.02). LENGTH of body, 6.33 (6.04-6.73).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both in the collection of the American Museum of Natural History and labelled, "South Bimini Isl., Bahamas, B. W. I., August 7, 1951, C. & P. Vaurie." PARATYPES: Bahamas: with same locality and collectors, six males collected between "June" and August 10, and seven females collected between July 11 and August 17, 1951

(AmMus; RCF); New Providence, Nassau, 5-VIII - Clench, 1m, 1f (MCZ). Cuba: Guantanamo, V-7, 1925, Br. Hioram, 1m (JCL). Haiti: Port au Prince, May 1925, Acc. 425-25, 1m (USNM); Fond Parisien, Feb. 11-18, '22, F. 4633B, alt. about 60 ft., 1f (AmMus); Grosmorne, 2, 17, '26, E. C. Leonard, 1f (USNM).

DISTRIBUTION: This distinct new species appears from the data at hand to be an inhabitant of the West Indies where it is known from the Bahamas, Cuba and Haiti.

DISCUSSION: The specific name given to this form reflects the fact that it is known only from the islands of the West Indies. One of the specimens had been labelled as "Geocnethus cubensis Barber and Bruner."

Dallasiellus (Ecarioceps) laevis NEW SPECIES

DIAGNOSIS: The single setigerous puncture on the costa coupled with the narrow, impunctate head and the mesopleural evaporatorium extended to the side of the segment permits recognition of this species within the subgenus. The narrow, very deep emargination at the apex of the male genital plate (Fig. 176) marks that sex from the males of all other species within the genus.

DESCRIPTION: MALE:- elongate oval, widest across pronotum. HEAD: length about two-thirds width, 0.84 (0.80-0.86): 1.29 (1.26-1.30); inter-ocular width, 0.77 (0.74-0.80); anterior outline almost semicircular, clypeus very slightly surpassing juga; surface gently convex, impunctate, with weak radiating rugae and one submarginal puncture in front of eye; ocelli moderate, separated from eye by space subequal to transverse diameter of an ocellus; juga ventrally polished, impunctate; maxillary plate punctate for most of its length; antennals, I, 0.29 (0.28-0.30): II, 0.39

(0.37-0.43): III, 0.38 (0.37-0.40): IV, 0.47 (0.46-0.50): V, 0.62 (0.60-0.63); bucculae lower than labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.45 (0.43-0.47): II, 0.86 (0.83-0.91): III, 0.57 (0.53-0.61): IV, 0.49 (0.36-0.43). PRONOTUM: length less than half of width, 1.39 (1.30-1.49): 2.95 (2.89-3.00); anterior margin moderately concave; lateral margins entire, distinctly narrowing from base; transverse impression postmedian, obsolete, absent medially; with several close-set, distinct punctures at ends of transverse impression and several widely-separated ones scattered between and on posterior lobe. SCUTELLUM: longer than wide, 2.32 (2.28-2.35): 1.82 (1.82-1.82); surface shining, numerous punctures scattered over disc, base and elongate apex impunctate. HEMELYTRON: corium and clavus finely but distinctly alutaceous, with usual rows of punctures, one on clavus and two on mesocorium paralleling claval suture; remainder of mesocorium impunctate; exocorium with numerous obsolete or distinct punctures scattered along most of length, except apex; costa with one setigerous puncture; membranal suture almost straight, lateral angle weakly prolonged; membrane about as long as basal width, not surpassing apex of abdomen. PROPLEURON: punctate ventrally, in depression and on posterior convexity; prosternal carinae very low, fine. MESOPLEURON: evaporatorium extended to side margin of segment; lateral area rugose, impunctate. METAPLEURON: evaporatorium with side margin gently concave; lateral area impunctate. STERNITES: shining, obsoletely alutaceous; with a few punctae laterally. LEGS: moderately long. TERMINALIA: apical margin of genital capsule roundly convex either side of narrow, very deep emargination (Fig. 176), punctate laterally; gonostylus as illustrated (Fig. 266). LENGTH of body, 5.97 (5.84-6.13).

FEMALE:- similar to male except pronotal and scutellar punctae more numerous and radial vein ends in area of punctae; membrane surpassing apex of abdomen. HEAD: length: width:: 0.87 (0.83-0.94): 1.30 (1.27-1.36); interocular width, 0.77 (0.73-0.81); antennals, I, 0.30 (0.28-0.33): II, 0.40 (0.38-0.43): III, 0.39 (0.38-0.41): IV, 0.49 (0.46-0.52): V, 0.61 (0.60-0.63); labials, I, 0.44 (0.43-0.46): II, 0.87 (0.80-0.93): III, 0.55 (0.53-0.60): IV, 0.43 (0.40-0.46). PRONOTUM: length: width:: 1.48 (1.43-1.52): 2.96 (2.84-3.13). SCUTELLUM: length: width:: 2.39 (2.21-2.60): 1.85 (1.74-2.02). LENGTH of body, 5.88 (5.55-6.30).

TYPE DATA: HOLOTYPE male and ALLOTYPE female both in the collection of the Museum of Comparative Zoology at Harvard and labelled: "Constanza, Aug. '38, Dom. Rep., 3-4,000 ft., Darlington." PARATYPES: DOMINICAN REPUBLIC: same data as types, 1m, 1f (RCF), 1f (MCZ); vic. Valle Nuevo, cloud forest 6,000 ft., Aug., '38, Darl., 1m, 1f (USNM), 1m, 1f (MCZ); fthills Cord. Cent. S. of Santiago, June '38, 1m, 1f (MCZ). HAITI: Mt. Basil to 4,700 ft., Sept. 9, 1934, Darlington, 1m, 2f (MCZ).

DISTRIBUTION: The present insect is known only from the two countries on the Island of Hispaniola in the West Indies--Haiti and the Dominican Republic.

DISCUSSION: The distribution of this form will undoubtedly be found to be more widespread than is indicated by the data on the type series.

Dallasiellus (Ecarinoceps) longirostris NEW SPECIES

DIAGNOSIS: The very elongate labium of which the first segment surpasses the bucculae by about one-third its own length sets this species apart from all others in the genus.

DESCRIPTION: (described from a single male) MALE:- elongate, parallel-sided, moderately convex above, more strongly so below. HEAD: width one-fifth greater than length, 1.28:1.00; interocular width, 0.86; anterior outline semicircular, eyes strongly projecting (about two-thirds of width); surface convex transversely and longitudinally, with numerous punctures except on clypeus; ocelli posterior to line connecting hind margins of eyes, separated from eye by more than transverse ocellar diameter; juga with no submarginal setigerous punctures except the one in front of the eye; clypeus very slightly longer than juga, very slightly narrowed at apex; jugum ventrally polished, impunctate; maxillary plate with several scattered, distinct punctures; antennals, I, 0.36: II, 0.43: III, 0.50: IV, 0.70: V, 0.94; bucculae about as high as labial II; labials, I very long, 0.81, surpassing base of bucculae and reaching base of prosternal carinae: II, 1.30: III, 1.00: IV, 1.10. PRONOTUM: length slightly more than half of width, 1.36: 2.53; anterior margin very deeply concave; side margins sub-parallel on basal two-thirds then more abruptly narrowed; side margin slightly sinuate at ends of submedian transverse impression; latter marked by irregular, wide band of large punctures; anterior lobe with wide band of close-set punctures immediately behind anterior emargination, and a deep, longitudinal impression laterally (Fig. 77); posterior lobe irregularly punctured on anterior half. SCUTELLUM: longer than wide, 2.21: 1.56; surface shining, rather convex, with numerous, irregularly-spaced punctures becoming finer apically. HEMELYTRON: corium and clavus polished; exocorium punctate for full length; mesocorium with two complete rows of punctures paralleling claval suture, several scattered punctures on inner half, numerous punctures on apical third; clavus with one complete and another

incomplete row of punctures; costa without setigerous punctures; membranal suture virtually straight; membrane very slightly longer than basal width, slightly surpassing apex of abdomen. PROPLEURON: polished, punctured on both convexities and in depression; prosternal carinae convex, as high as labial II. MESOPLEURON: evaporatorium reaching side margin of segment; lateral polished area punctate. METAPLEURON: lateral edge of evaporatorium straight; lateral area impunctate. STERNITES: polished, punctate laterally; sutures finely crenulate. LEGS: moderately long. TERMINALIA: margin of genital capsule flared, surface with numerous punctures, gonostylus as illustrated (Fig. 267). LENGTH of body, 5.92.

FEMALE:- unknown.

TYPE DATA: HOLOTYPE male, "Amazonas, Manaus Brazil , Parko, 7, 1941," in the collection of Dr. Jose C. M. Carvalho, of Rio de Janeiro.

DISTRIBUTION: This very distinct new species is known only from the type from Brazil.

DISCUSSION: The elongate form, long labium and lack of submarginal setigerous punctures on the head is suggestive of Uhler's species "Lobonotus anthracinus," but members of this species easily separated therefrom by the generic character of the peritreme, and also by the very long first labial segment which here exceeds the bucculae by about one-third of its length. The broad, longitudinal impression laterally on the anterior pronotal lobe appears to be unique in the Cydnidae of the Western Hemisphere. This character, however, is probably restricted to the male.

Dallasiellus (Ecarinoceps) megalocephalus NEW SPECIES

DIAGNOSIS: The very large head (Fig. 62) which is broader than half the width of the pronotum appears to offer a valid feature for separating this cydnid from all others in the New World.

DESCRIPTION: MALE:- oval. HEAD: length about three-fifths of width, 1.54 (1.49-1.56): 2.52 (2.37-2.60); interocular width, 1.51 (1.49-1.56); anterior outline semicircular, sometimes flattened; clypeus as long as juga, strongly narrowed at apex; surface concave, vertex with a broad, shallow, U-shaped carina between ocelli; juga with few to several prominent punctures; ocelli moderate, removed from eyes by a space twice an ocellar width; juga ventrally polished, impunctate; maxillary plate with punctate impression mesad of antennal insertion and punctate along basal margin; antennals, I, 0.36 (0.36-0.36): II, 0.60 (0.53-0.66): III, 0.56 (0.50-0.60): IV, 0.81 (0.73-0.86): V, 0.94 (0.90-1.00); bucculae lower than labial II; labium reaching between middle coxae; segments, I, 0.73 (0.70-0.76): II, 1.04 (0.96-1.10): III, 1.21 (1.16-1.23): IV, 0.76 (0.73-0.80). PRONOTUM: length about half of width, 2.45 (2.38-2.55): 4.75 (4.47-4.92); anterior margin shallowly concave, about two-thirds of basal width; side margins entire, gradually narrowed from base and more abruptly at apical third, with five or six submarginal setigerous punctures; transverse impression obsolete to absent, marked by postmedian irregular band of punctures; anterior lobe with a row of punctures paralleling anterior emargination and several punctures laterally; posterior lobe with several punctures medially. SCUTELLUM: length and width equal, 3.01 (2.85-3.12): 3.01 (2.84-3.12); surface shining, with numerous punctures except across base and apex. HEMELYTRON: corium and clavus very weakly alutaceous; exocorium abundantly punctate for full

length; mesocorium with two complete rows of punctures paralleling claval suture, and numerous punctures at base and apex; clavus with several punctures in addition to longitudinal row; costa with one setigerous puncture; membranal suture weakly concave, lateral angle acute; membrane reaching apex of abdomen, slightly longer than basal width. PROPLEURON: impunctate except along anterior margin and in depression; prosternal carinae very low, thick, blunt. MESOPLEURON: evaporatorium reaching side margin of segment; lateral shining area rugo-punctate. METAPLEURON: evaporatorium slightly concave laterally; lateral area impunctate. STERNITES: polished, impunctate. TERMINALIA: apical margin of genital plate with deep U-shaped notch (Fig. 175), surface impunctate; gonostylus as illustrated (Fig. 268). LENGTH of body, 8.93 (8.50-9.26).

FEMALE (based on two specimens):- similar to males, but surface of head flattened or concave only on juga. HEAD: length: width:: 2.32 (2.10-2.55): 4.63 (4.23-5.00); interocular width, 1.49 (1.43-1.56); antennals, I, 0.35 (0.35-0.36): II, 0.58 (0.53-0.63): III, 0.52 (0.50-0.63): IV, 0.82 (0.73-0.92): V, 0.93 (0.86-1.00); labials, I, 0.68 (0.63-0.73): II, 0.99 (0.96-1.03): III, 1.21 (1.16-1.26): IV, 0.76 (0.70-0.83). PRONOTUM: length: width:: 2.32 (2.10-2.55): 4.63 (4.26-5.00). SCUTELLUM: length: width:: 2.92 (2.70-3.15): 2.92 (2.70-3.15). LENGTH of body, 8.53 (7.92-9.14).

TYPE DATA: HOLOTYPE male: "Barro Colo I, CZ X-XI-1941, Jas Zetek, No 4915," in the collection of the United States National Museum; ALLOTYPE female: "Chapada, Brazil, Acc. No. 2966, Aug." in the collection of the Carnegie Museum. PARATYPES: Barro Colo I., CZ, Apr. 1941, Jas Zetek, No. 4776, collected at light, 1m (USNM); Barro Colo Id., CZ, VII-VIII-42, Jas Zetek, No. 4985, 1m (RCF); Amazonas, Manaus Brazil Parko, 11, 1941, 1m

(JCMC); Chapada, Brazil, Acc. No. 2966, Aug., 1m, 1f (Car); Kartabo, B. ritish G. uiana , So. Am. 6/18/25, C. C. Searl, 1f (CalAc); British Guiana, Upper Kutari R., Jan.-March, 1936, G. A. Hudson, 1f (BMNH).

DISTRIBUTION: The type material was from Panama Canal Zone, British Guiana and Brazil, suggesting a moderately large range in northern South America and southern Central America.

DISCUSSION: The extremely large head (Fig. 62) marks this as being quite distinct from all other New World Cydnidae. In all the males and some of the females studied the surface of the head was distinctly concave, in the other females flattened with the juga longitudinally depressed along the middle. The punctation of the head appears to become a little more numerous and dense in the material from the southern part of the range, but the very broad head and the unusual deep, U-shaped notch at the apex of the genital capsule of the male confirm that these still belong to one species. One of the Chapada females listed among the paratypes appears to be a malformed individual and so was not included in the measurements given above, the pronotum was shrunken and reduced in size, as was the apical part of the scutellum with a consequent change in size and shape of these two parts.

Dallasiellus (Ecarinoceps) reflexus NEW SPECIES

DIAGNOSIS: The high bucculae whose posterior termination is abrupt, not evanescent, mark this species within the subgenus.

DESCRIPTION: (known from three females) FEMALE:- oval, widest at mid-length. HEAD: length two-thirds of width, 1.22 (1.17-1.30): 1.84 (1.75-1.92); interocular width, 1.12 (1.04-1.17); anterior outline a faintly

flattened semicircle; clypeus as long as juga, distinctly narrowed apically; juga impunctate, with few weak, radiating rugae and but one submarginal setigerous puncture in front of eye; ocelli small, separated from eye by almost twice transverse ocellar width; jugum ventrally and maxillary plate, except at base, shining, impunctate; antennals, I, 0.35 (0.33-0.40): II, 0.63 (0.60-0.66): III, 0.53 (0.53-0.53): IV, 0.71 (0.70-0.73): V, 0.82 (0.80-0.83); bucculae higher than labial II, abruptly terminated posteriorly; labium reaching posterior half of mesosternum, segments, I, 0.63 (0.56-0.70): II, 1.05 (0.96-1.10): III, 0.72 (0.66-0.76): IV, 0.53 (0.50-0.56). PRONOTUM: length more than half of width, 2.36 (2.21-2.44): 4.29 (4.10-4.52); anterior margin moderately concave; side margins entire, gently narrowed from base, more abruptly so on apical third; transverse impression obsolete to absent; with few punctures along transverse impression, on middle of posterior lobe and sometimes behind anterior emargination, remainder of surface impunctate. SCUTELLUM: longer than broad, 3.16 (3.00-3.35): 2.61 (2.53-2.69); surface shining, punctured except at base and apex. HEMELYTRON: corium and clavus finely but distinctly alutaceous; exocorium and mesocorium mostly with very weak to obsolete fine punctures, mesocorium also with two rows of coarser punctures paralleling claval suture; clavus with one row and basal part of another row of punctures; costa broadly reflexed, with two setigerous punctures; membranal suture nearly straight, lateral angle weakly produced; membrane surpassing tip of abdomen, length longer than basal width. PROPLEURON: shining, impunctate except near acetabulum and in depression; prosternal carinae low, acute. MESOPLEURON: evaporatorium reaching lateral margin of segment; lateral area impunctate. METAPLEURON: lateral edge of evaporatorium weakly concave; lateral area impunctate. STERNITES: finely

alutaceous, impunctate except in spiracular area. LEGS: moderately long. LENGTH of body, 8.47 (8.24-8.85).

TYPE DATA: HOLOTYPE female, in collection of the United States National Museum, labelled, "Colima, Vulcan, Mex., L. Conrad." PARATYPES: Costa Rica, la Vruca, No. 79, 1f (Vienna); Redlands, Fla., J. C. Lutz Collection No. 86, 1f (JCL).

DISTRIBUTION: The specimen records from Mexico and Costa Rica in Central America coupled with the one from Florida suggest that this species might also occur on some of the islands of the West Indies.

DISCUSSION: The Florida paratype differs slightly from the other two specimens in having the hemelytra slightly shorter (membrane barely surpassing apex of abdomen) with the membranal suture straighter and not prolonged at lateral angle.

Subgenus Dallasiellus Berg

1901 Dallasiellus Berg, Com. Mus. Buenos Aires, 1:281.

(synonymy same as that for genus, see p. 367)

DIAGNOSIS: Species of this subgenus may be recognized by the presence of a complete dorsal carina on the margin of the head plus the lack of coarse crenulations on the posterior margin of the mesopleuron and the entire mesopleural evaporatorium which reaches uninterrupted to the posterior margin of the segment.

DESCRIPTION: agreeing with the generic description with the following important modifications: HEAD: jugum with complete, fine, marginal carina dorsally, usually with two or more submarginal setigerous punctures; labial length variable from between middle coxae to base of sternite II.

MESOPLEURON: posterior margin usually with fine crenulations or none; evaporatorium extending into postero-lateral angle of segment, usually attaining lateral margin. METAPLEURON: lateral margin of evaporatorium usually straight or nearly so (deeply concave only in fusus); apex of peritreme not (except in fusus) fusing with surrounding cuticula. LEGS: posterior tibia of both sexes without angulation near base of postero-ventral margin, femora not tuberculate ventrally on apical fourth.

SUBGENOTYPE: Data for subgenotype of nominal subgenus is the same as for genotype.

DISTRIBUTION: From specimens studied, the range of this subgenus appears to extend from the southwestern United States south through central America and the West Indies to southern South America.

DISCUSSION: Comments on the definition and relationships of this taxon will be found in the generic discussion.

Several of the new species described in the present study appear to be somewhat intermediate between nominal Dallasiellus and the subgenus Pseudopangaeus. Notes on these will be given at appropriate places in the text.

Key to the Species of Subgenus Dallasiellus

1. Dorsum of head coarsely, and in large part rugosely punctate. 2
   Dorsum of head not coarsely, rugo-punctate, either impunctate or with widely separated punctures. 3
2. Bucculae abruptly terminated posteriorly (as in Fig. 23); corium and sternites not distinctly alutaceous. . . . puncticeps n.sp. p. 445
   Bucculae evanescent posteriorly; corium and sternites distinctly alutaceous. . . . . .solitaria (Horv.) p. 447

3. Peritreme abruptly terminated apically (Fig. 107); lateral margin of metapleural evaporatorium straight or gently concave. 4

Apex of peritreme not abruptly terminated, fusing with surrounding cuticula (as in Fig. 106); lateral margin of metapleural evaporatorium very deeply concave (Fig. 106). . . . . .fusus n.sp. p. 419

4. Mesopleural evaporatorium interrupted near or at posterior margin by transverse, polished band (Fig. 108). 5

Mesopleural evaporatorium not thus interrupted (Fig. 107). 6

5. Corium highly polished; basal half of costa strongly depressed; male with ventral margin of anterior tibia abruptly, subquadrately expanded (Fig. 128) at apex. . . . . dilatipes n.sp. p. 417

Corium distinctly alutaceous; costa strongly convex for full length; anterior tibia of male not expanded ventrally near apex. . . . . .interruptus n.sp. p. 424

6. Size larger, length of body 8 mm or more. 7

Size smaller, length of body less than 7.5 mm. 10

7. Prosternal carinae as high as or higher than labial II (Fig. 27) . . . . . levipennis-prosternalis complex p. 427

Prosternal carinae not more than half as high as labial II. 8

8. Sternite IV with two submarginal setigerous tubercles laterally . . . . . bergi (Sign.) p. 415

Sternite IV with one submarginal setigerous tubercle laterally. . . . 9

9. Scutellum discally with numerous (35+) coarse, sunken, foveate punctures crowded, forming coarse, transverse rugae between them. . . . . planicollis (Horv.) p. 443

Scutellum with few, widely scattered, finer punctures. . . . . horvathi n.sp. p. 423

10. Labium long, distinctly surpassing posterior coxae; prosternal carinae abruptly lobed (Fig. 25).. . . . . longulus (Dall.) p. 429

Labium short, not reaching apices of posterior coxae; prosternal carinae not lobed. 11

11. Antennal II shorter than I, about half as long as III. . . . . orchidiphilus n.sp. p. 438

Antennal II longer than I, nearly or quite equal to III. 12

12. Scutellum discally without large punctures; apex of mesocorium impunctate or with few punctures near radial vein. 13

Scutellum discally and usually mesocorium apically with numerous distinct punctures. 14

13. Jugum with one submarginal setigerous puncture in front of eye. . . . . viduus (Stal) p.451

Jugum with four submarginal setigerous punctures in front of eye. . . . . .triangularis n.sp. p.450

14. Jugum with three, widely-separated setigerous punctures anterior to eye (Fig. 44). 15

Jugum with two, three or more close-set, setigerous punctures anterior to eye, sometimes with several more widely spaced ones distally (Figs. 42, 43). . . . . lugubris-reversus complex p.432

15. Corium distinctly alutaceous (at 15X) . . . . . alutaceus n.sp. p.410

Corium shining, not distinctly alutaceous (at 30X). 16

16. Costa without setigerous punctures; pronotal transverse impression weak, marked by irregular band of small punctures, ovalis n.sp. p.441

Costa with one setigerous puncture; pronotal transverse impression distinct, obsolete medially, marked by regular row of large punctures. 17

17. Larger, length of body 6.4-7.0; head with subapical, distinct poorly defined depression (in area indicated by dotted circle on Fig. 44); clypeus elevated apically. . . . . bacchinus n.sp. p. 413

Smaller, length of body 4.9-5.5; head without subapical depression; clypeus not elevated apically. . . .murinus (VanD.) p. 435

Dallasiellus (Dallasiellus) alutaceus NEW SPECIES

DIAGNOSIS: Among the moderately large species (5.5-6.5) with the three widely separated setigerous punctures on the submargin of the head, this one may be recognized by the short labium which does not surpass the middle coxae and the distinct alutaceous sculpturing of the corium.

DESCRIPTION: MALE:- oval, slightly elongate. HEAD: length about three-fifths of width, 0.99 (0.95-1.06): 1.59 (1.44-1.69); interocular width, 0.87 (0.83-0.93); anterior outline less than a full semicircle, clypeus as long as juga and strongly narrowed apically; surface weakly alutaceous, with scattered fine punctures; jugum with obsolete radiating rugae, with three widely separated setigerous punctures submarginally; ocelli large, separated from eye by slightly more than transverse ocellar width; jugum ventrally and maxillary plate, except on basal fourth, polished, impunctate; antennals, I, 0.32 (0.30-0.33): II, 0.37 (0.34-0.43): III, 0.39 (0.39-0.40): IV, 0.55 (0.52-0.60): V, 0.62 (0.55-0.66); bucculae about as high as labial II, evanescent posteriorly; labium reaching base of middle coxae, segments, I, 0.51 (0.45-0.60): II, 0.85 (0.75-0.94): III,

0.60 (0.58-0.63): IV, 0.50 (0.46-0.54). PRONOTUM: length slightly more than half width, 1.63 (1.57-1.82): 3.16 (2.93-3.43); anterior margin moderately emarginate; side margins entire, straight on basal two-thirds, with five or six setigerous punctures submarginally; transverse impression submedian, marked by regular row of close-set punctures; anterior lobe with curved row of punctures in subapical impression and numerous punctures laterally; posterior lobe with distinct punctures most numerous medially. SCUTELLUM: longer than wide, 2.24 (2.08-2.40): 1.96 (1.82-2.15); shining, with numerous crowded punctures from near base almost to apex, latter minutely punctate. HEMELYTRON: clavus and corium strongly alutaceous; clavus with one complete and one partial row of punctures; mesocorium with two complete rows of punctures paralleling claval suture, discally with distinct close punctures only at base and apex; exocorium with numerous distinct punctures for full length; costa without or with one setigerous puncture; membranal suture straight, lateral angle not prolonged; membrane longer than basal width, surpassing apex of abdomen by about one-fourth its length. PROPLEURON: feebly alutaceous, distinctly punctate in depression and anterior to acetabulum, minutely punctate on convexities; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium entire; lateral area impunctate. METAPLEURON: peritreme abruptly terminated apically; lateral margin of evaporatorium feebly concave; lateral area impunctate. LEGS: not specially modified. STERNITES: distinctly alutaceous, with few punctures and small rugae near spiracular area. TERMINALIA: genital capsule finely alutaceous, obsoletely punctate except for crowded punctures in lateral angles, apical margin broadly and very shallowly emarginate; gonostylus as illustrated (Fig. 270). LENGTH of body, 5.91 (5.61-6.42).

FEMALE:- very similar to male: HEAD: length: width:: 0.98 (0.96-1.00): 1.58 (1.56-1.60); interocular width, 0.92 (0.90-0.93); antennals, I, 0.31 (0.30-0.33): II, 0.36 (0.36-0.40); III, 0.39 (0.36-0.43): IV, 0.51 (0.50-0.53): V, 0.61 (0.60-0.63); labials, I, 0.53 (0.53-0.56): II, 0.80 (0.76-0.83): III, 0.62 (0.62-0.63): IV, 0.46 (0.46-0.50). PRONOTUM: length: width:: 1.64 (1.46-1.75): 3.17 (3.06-3.26). SCUTELLUM: length: width:: 2.30 (2.22-2.40): 1.98 (1.89-2.02). LENGTH of body, 5.76 (5.57-5.92).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both in the collection of the United States National Museum and labelled, "Rosario Lake, Rogagua, Boliv., W. M. Mann, Oct. 28-Nov. 9, 1921. Mulford Bio. Expl., 1921-22." PARATYPES: BOLIVIA: same data as types, 7f (USNM, RCF); Chapare, Bolivia, VII-26-45, 400 m., R. Zischka, #163, 1m (USNM); Rurrenabaque Beni, Bolivia, W. M.Mann, Oct. 1921, Mulford Bio. Expl., 1921-22, 8f (USNM, RCF); Sta. Cruz de la Sierra, Bol., 450 m., J. Steinbach, Nov. 1910, C. M. 4550, 2f (Car). BRAZIL: M. Gerais, Bras., Vicosa, 4-45, Carvalho col., 1m (JMC); New Teutonia, Brazil, Jan. 1939, Fritz Plaumann, 1f (HMH); Nova Teutonia, Santa Catarina, Brazil, XII-13, 1946, F. Plaumann, 1f (JCL); Rio de Janeiro, Brazil, P. Wygodzinsky, 2m (USNM, RCF); same locality, Acc. No. 2966, 1f (Car). COLOMBIA: Colombia on wild orchid intercepted at Hoboken, N. J. V-22-41, 1f (USNM).

DISTRIBUTION: As indicated by the type data listed above, alutaceus occurs in Colombia, Bolivia and the southern half of Brazil.

DISCUSSION: The specific name refers to the distinctly alutaceous sculpturing of the corium.

Dallasiellus (Dallasiellus) bacchinus NEW SPECIES

DIAGNOSIS: The weakly-defined, but definite subapical impression near the apex of the head (indicated by dotted outline on Fig. 44) can be used to separate this species from all others in the subgenus.

DESCRIPTION: MALE:- elongate-oval. HEAD: length about three-fourths width, 1.21 (1.17-1.30): 1.69 (1.62-1.80); interocular width, 0.99 (0.95-1.04); anterior outline rounded, juga as long or slightly longer than clypeus and almost contiguous beyond it; jugum with three submarginal setigerous punctures; surface flattened, with weakly defined but definite subapical impression (Fig. 44 indicated by dotted circle), smooth, distinctly punctured anterior to ocelli; latter well developed, separated from eye by space less than twice transverse ocellar width; jugum ventrally and maxillary plate (except posteriorly) impunctate; antennals, I, 0.38 (0.36-0.40): II, 0.52 (0.48-0.56): III, 0.45 (0.43-0.48): IV, 0.67 (0.63-0.73): V, 0.79 (0.73-0.85); bucculae about as high as labial II; labium reaching apices of middle coxae, segments, I, 0.67 (0.66-0.68): II, 1.04 (1.00-1.10): III, 0.82 (0.80-0.83): IV, 0.61 (0.60-0.63). PRONOTUM: length more than half of width, 1.89 (1.82-1.95): 3.46 (3.28-3.71); anterior margin broadly and deeply emarginate; lateral margins entire, with five or six submarginal setigerous punctures; transverse impression slightly behind middle, weakly impressed laterally, marked by irregular row of distinct punctures; anterior lobe with curved row of punctures paralleling anterior emargination and more than fifteen punctures laterally, these equal to those of transverse impression; posterior lobe with a number of punctures at middle and few laterally. SCUTELLUM: little longer than broad, 2.52 (2.42-2.73): 2.17 (2.08-2.31); surface polished, impunctate basally and apically

elsewhere with numerous irregularly spaced coarse punctures. HEMELYTRON: corium polished, with two impressed rows of coarser punctures paralleling claval suture, mesocorium obsoletely or impunctate medially, with few moderate punctures near base and numerous finer ones near apex; exocorium distinctly punctured full length on outer half or more; costa with one setigerous puncture; clavus polished with one row of punctures extending almost to apex and shorter row laterad; membranal suture straight, outer angle slightly acute; membrane surpassing apex of abdomen, about one-fourth longer than basal width. PROPLEURON: punctured only at antero-ventral angle and in depression; prosternal carinae low, distinct, most prominent anteriorly. MESOPLEURON: evaporatorium reaching broadly to lateral margin; lateral area impunctate. METAPLEURON: evaporatorium separated from side margin by narrow, polished, impunctate area; peritreme attaining middle of segment, abruptly terminated. LEGS: not specially modified. STERNITES: shining, weakly alutaceous, rugose, with few punctures laterally. TERMINALIA: genital capsule polished, punctate laterally, apical margin very broadly, shallowly V-emarginate; gonostylus as illustrated (Fig. 284). LENGTH of body, 6.63 (6.42-7.00).

FEMALE:- very similar to male. HEAD: length: width:: 1.21 (1.18-1.26); 1.74 (1.71-1.80); interocular width, 1.04 (1.01-1.13); antennals, I, 0.38 (0.35-0.41): II, 0.52 (0.50-0.55): III, 0.46 (0.43-0.48): IV, 0.67 (0.65-0.70): V, 0.79 (0.78-0.83); labials, I, 0.65 (0.63-0.70): II, 1.03 (1.00-1.06): III, 0.91 (0.82-0.93): IV, 0.62 (0.60-0.66). PRONOTUM: length: width:: 1.82 (1.77-1.89): 3.48 (3.45-3.58). SCUTELLUM: longer than broad, 2.55 (2.47-2.60): 2.25 (2.15-2.43). LENGTH of body, 6.56 (6.42-6.71).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both in the collection

of the United States National Museum and labelled, "La Chorrera, Pan., 10-V-12, Aug. Busck." PARATYPES: MEXICO: Mex., 1785, Collection C. F. Baker, 1m (USNM). PANAMA: same data as type, 1f (USNM). Ancon, C. Z., Pan., Apr. 1911, Kraft, arc-light globe, 1m, 1f (RCF). Aguadulee, IV-12-41, R. Panama, 1m, 1f (MCZ).

DISTRIBUTION: With the exception of the one individual from Mexico, all specimens studied had come from Panama.

DISCUSSION: The specific name alludes to the vague, cup-like impression near the apex of the head. As is often the case with specimens of Cydnidae, the only habit notes borne referred to specimens having been collected at light.

Dallasiellus (Dallasiellus) bergi (Signoret) NEW COMBINATION

1883 Geotomus bergi Signoret, Ann. Soc. Ann. France, 1883:36, pl. 2, fig. 145.
1893 Geotomus bergi Lethierry and Severin, Gen. Catal. Hemip., 1:72.

DIAGNOSIS: Among the large species of the subgenus, this one may be recognized by the presence of two setigerous tubercles on the lateral submargin of sternite IV plus the very low prosternal carinae.

DESCRIPTION: (from a single male) MALE: oval, widest near midlength. HEAD: length almost two-thirds width, 1.51: 2.34; interocular width, 1.43; anterior outline a full semicircle, clypeus as long as juga; latter impunctate, almost smooth, submargin with four close-set setigerous punctures in front of eyes and one more widely spaced beyond; ocelli moderately large, situated about half way between eye and midline of head, separated from eye by a space nearly three times a transverse ocellar width; jugum ventrally and most of maxillary plate polished, impunctate;

antennals, I, 0.41: II, 0.56: III, 0.70: IV, 0.80: V, 0.90; bucculae as high as labial II; labium reaching between hind coxae, segments, I, 1.03: II, 1.66: III, 1.63: IV, 1.10. PRONOTUM: length more than half width, 3.13: 5.43; anterior margin moderately, simply emarginate; side margins strongly sinuate opposite ends of transverse impression, submargin with row of six setigerous punctures; transverse impression submedian, very weak, absent medially, marked by medially interrupted row of close-set punctures; anterior lobe with punctured lunate impression subapically, with about five punctures laterally; posterior lobe impunctate except for few punctures at middle. SCUTELLUM: longer than wide, 3.34: 3.24; disc polished, with irregularly spaced, coarse, sunken punctures, apex impunctate. HEMELYTRON: corium and clavus polished, clavus with double row of punctures for more than half its length; mesocorium impunctate except for two complete rows paralleling claval suture and few punctures at latero-apical angle; exocorium with numerous punctures for full length; membranal suture weakly concave, lateral angle slightly prolonged; costa with two setigerous punctures; membrane slightly surpassing apex of abdomen, length little more than basal width. PROPLEURON: polished, impunctate, even in depression; prosternal carinae low, about half as high as labial II. MESOPLEURON: evaporatorium entire, reaching lateral margin of segment; lateral area impunctate. METAPLEURON: evaporatorium occupying about three-fourths of segment; lateral area impunctate. STERNITES: polished, impunctate. TERMINALIA: apical margin of genital capsule entire, faintly sinuate either side of middle, surface punctate in lateral impressions; gonostylus as illustrated (Fig. 271). LENGTH of body, 10.22.

TYPE DATA: The original specimen was said by Signoret (loc. cit.) to

have come from "Missiones," Argentina. The specimen is now lost, unless it stands unlabelled in what is left of the Berg collections in Argentina.

DISTRIBUTION: The lone specimen studied was from Peru.

DISCUSSION: Since Signoret's type has not been available for examination or comparison, the present use of the name bergi must be considered tentative. The single specimen to which it is here applied agrees rather well with the original description, but has only two instead of three setigerous punctures on the costa. Comparative comments as given by Horvath (1919:247) when he described certain closely allied new species were helpful in formulating the present concept of this species.

SPECIMENS STUDIED: 1 male. PERU: Moyobamba Region, I-8-26, F 6149, H. Bassler Collection, Acc. 33591, 1m (AmMus).

Dallasiellus (Dallasiellus) dilatipes NEW SPECIES

DIAGNOSIS: Since this species is known only from the male the separation of it must be made on the basis of sex, and because the male shows such strong and unusual modifications they form the most convenient features for characterization of dilatipes: 1) the peculiar quadrate lobe at the apex of the basal margin of the anterior tibia (Fig. 128); 2) the costa strongly flattened and depressed; 3) posterior femur with a prominent strong knob near middle of ventral margin, and spines of postero-ventral row on hind tibia directed downward from prominent tubercles (Fig. 149) instead of the usual oblique position from a serrated margin. Any one of these is sufficient to separate the males of this species from the males of any other species within this genus.

DESCRIPTION: (based on a single male) MALE:- oval, widest near midlength.

HEAD: length more than half of width, 1.90: 2.77; interocular width, 1.67; anterior outline semicircular, clypeus as long as juga and only slightly narrowed apically; surface convex with scattered minute punctures and weak, incomplete radiating rugae; jugum submarginally with three widely separated setigerous punctures; ocelli large, separated from eye by a space subequal to transverse ocellar width; juga ventrally polished, impunctate; maxillary plate on apical half polished with a few scattered punctures; posterior half alutaceous and punctate; antennals, I, 0.66: II, 0.70: III, 0.70: IV, 1.00: V, 1.00; bucculae higher than labial II; labium reaching between posterior coxae, segments, I, 1.30: II, 1.99: III, 1.82: IV, 1.31. PRONOTUM: length more than half width, 3.31: 6.30; anterior margin shallowly, doubly emarginate; side margins entire, very weakly sinuate at midlength; with six or seven submarginal setigerous punctures; transverse impression obsolete, absent medially, marked by medially interrupted row of very close-set punctures; anterior lobe with curved, subapical band of intermixed minute and close-set coarse punctures, laterally similarly with mixed but sparser punctures; posterior lobe with scattered moderate and more numerous minute punctures. SCUTELLUM: longer than broad, 1.79: 1.67; polished, with numerous minute punctures and scattered coarser punctures discally becoming finer toward apex. HEMELYTRON: corium and clavus polished; clavus with two lateral and one mesal row of punctures; mesocorium with two complete rows of punctures paralleling claval suture, discally with scattered fine punctures becoming crowded toward apex; exocorium for full length with numerous crowded punctures over most of surface; costa depressed, flattened, with two setigerous punctures on basal half; membranal suture nearly straight, lateral angle little produced; membrane surpassing apex of abdomen, longer

than basal width. PROPLEURON: weakly punctate, rugose on anterior convexity, distinctly punctate in depression and laterally on posterior convexity; prosternal carinae very low, less than half as high as labial II. MESOPLEURON: evaporatorium interrupted near posterior margin by polished band (as in Fig. 108); lateral area roughened. METAPLEURON: evaporatorium occupying more than three-fourths of segment, side margin straight; lateral area impunctate. STERNITES: polished, with weak to obsolete minute punctures over most of surface and longitudinal rugae laterally. LEGS: anterior tibia with subquadrate lobe at apex of lower margin (Fig. 128); posterior leg (Fig. 149) with a prominent knob near middle of ventral margin and spines on posteroventral margin of tibia arising ventrally from prominent tubercles. TERMINALIA: apex of genital capsule prolonged, weakly emarginate, surface with scattered fine punctures; gonostylus as illustrated (Fig. 272). LENGTH of body, 11.97.

TYPE DATA: Described from a single HOLOTYPE male in the collection of John C. Lutz labelled "Nova Teutonia, Santa Catarina, Brazil, XII-24, 1950, F. Plaumann."

DISTRIBUTION: This species is known only from the male type from Brazil.

DISCUSSION: Although there is always some risk contingent on the describing of a new species from a single specimen, the numerous strong, unique modifications found on the present specimen leaves no room for doubt concerning its validity. The trivial name alludes to the peculiar dilation of the anterior tibiae.

Dallasiellus (Dallasiellus) fusus NEW SPECIES

DIAGNOSIS: The fusing of the apex of the peritreme to the surrounding cuticula permits ready recognition of this species within the subgenus.

DESCRIPTION: MALE (four specimens):- oval, widest near midlength. HEAD: length about two-thirds width, 0.99 (0.90-1.03): 1.47 (1.36-1.53); interocular width, 0.91 (0.90-0.93); anterior outline a somewhat truncated semicircle, juga longer than and contiguous in front of clypeus; surface finely alutaceous, impunctate only in and immediately anterior to interocellar area, remainder of surface with numerous fine punctures and distinct, radiating rugae; jugum with submarginal row of close-set setigerous punctures extending little more than three-fourths of way to apex; ocelli small, separated from eye by space about three times ocellar width; jugum ventrally and maxillary plate, except basally, shining, impunctate; antennals, I, 0.31 (0.30-0.33): II, 0.33 (0.33-0.33): III, 0.38 (0.36-0.43): IV, 0.46 (0.43-0.49): V, 0.51 (0.50-0.53); bucculae higher than labial II, evanescent posteriorly; labium attaining mesosternum or bases of middle coxae, segments, I, 0.44 (0.43-0.44): II, 0.77 (0.69-0.83): III, 0.54 (0.52-0.58): IV, 0.41 (0.38-0.46). PRONOTUM: length more than half width, 1.76 (1.62-1.95): 3.22 (3.06-3.39); anterior margin moderately, singly emarginate; lateral margin entire, straight on basal third, with seven to eleven setigerous punctures submarginally; transverse impression almost wholly absent, marked by irregular band of widely separated punctures; anterior lobe with numerous punctures laterally and few subapically, elsewhere with scattered minute punctures; posterior lobe with several punctures medially and laterally. SCUTELLUM: longer than wide, 2.11 (2.02-2.30): 2.02 (1.89-2.15); disc shining, with few widely scattered punctures, impunctate on basal fourth and apex. HEMELYTRON: clavus and corium alutaceous; clavus with two irregular, confused rows of punctures; mesocorium with one complete and one incomplete row of punctures paralleling claval suture, discally with

punctures sparse and scattered or numerous; exocorium punctured similarly to disc of mesocorium; costa with three or four setigerous punctures; membranal suture nearly straight, lateral angle sometimes weakly produced; membrane longer than basal width, just reaching apex of abdomen. PROPLEURON: finely alutaceous, punctured sparsely in depression and more abundantly anterior to acetabulum; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium reaching into postero-lateral angle but not to lateral margin of segment; lateral area with few coarse punctures. METAPLEURON: apex of peritreme fused with surrounding peritreme (as in Fig. 106), not abruptly terminated; evaporatorium with lateral margin deeply concave, C-shaped; lateral area impunctate, extended almost to apex of peritreme. LEGS: not specially modified. STERNITES: shining, becoming more distinctly alutaceous laterally; laterally also with several longitudinal rugae. TERMINALIA: genital capsule shining, distinctly punctured in lateral angle, with broad submarginal impression laterally, apical margin entire, almost straight; gonostylus as illustrated (Fig. 273). LENGTH of body, 6.22 (5.97-6.66).

FEMALE:- very similar to male. HEAD: length: width:: 0.98 (0.90-1.06): 1.50 (0.36-1.58); interocular width, 0.98 (0.89-1.03); antennals, I, 0.32 (0.30-0.36): II, 0.31 (0.30-0.36): III, 0.39 (0.36-0.43): IV, 0.48 (0.43-0.53): V, 0.55 (0.53-0.62); labials, I, 0.45 (0.42-0.46): II, 0.76 (0.68-0.86): III, 0.55 (0.53-0.60): IV, 0.41 (0.40-0.43). PRONOTUM: length: width:: 1.80 (1.56-2.02): 3.21 (2.93-3.52). SCUTELLUM: length: width:: 2.19 (2.02-2.60): 2.10 (1.75-2.60). LENGTH of body, 596 (5.34-6.74).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, both in the collection of California Academy of Sciences and labelled, "12 miles S. E. Nochixtlan,

Oax., Mex., XII-13-48, H. B. Leech collector." PARATYPES: same data as types, 1f (RCF); Coyotes, Durango Dist., Dgo., Mex., 8300 ft., Aug. 8, '47, D. Rockefeller Exp., Gertsch, 1m (AmMus); Tejupilco, Mex., Temescaltepec, VI-16, 21, 27-33, H. E. Hinton, R. L. Usinger collectors, 1m, 2f (RLU); Real de Arriba, Temescaltepec, Mex., VI-7, VII-9-30, H. E. Hinton, R. L. Usinger, 3f (RLU) (RCF); 15 mi. S. El Guarda, D. F., XI-14-46, E. C. Van Dyke collector, 1f (CalAc); Jalapa, Mexico (USNM); Tozi, XI, Mex., 1f (USNM); Guadalajara, Jalisco, Mex., March, 1923, 1f (USNM); Ajuno, Mich., Mexico, May, 1923, W. M. Mann collector, 1f (USNM).

DISTRIBUTION: Fifteen specimens are known, all of them labelled as having come from the central half of Mexico.

DISCUSSION: The present species is named to call attention to the fusion of the apex of the peritreme with the surrounding cuticula. This character, as well as the numerous coarse crenulations on the posterior margin of the mesopleuron and the very deeply C-shaped metapleural evaporatorium (all similar to Fig. 106) point out the close relationship of fusus to the slightly more northern species of the subgenus Pseudopangaeus. Although these three characteristics outweigh in number the single feature of the interrupted mesopleural evaporatorium, the more logical placement of fusus is in nominal Dallasiellus. To separate the two subgenera on the basis of the fused peritremal apex would permit placing the present species with its apparently close relatives of Pseudopangaeus, but would do violence to the distributional pattern because it would necessitate transferring californicus to Dallasiellus Dallasiellus as a geographically detached species. The presently accepted placement appears best in that it permits the more northern species to form a closely knit offshoot of the more

southern subgenus by way of fusus. Further, fusus differs from all members of Pseudopangaeus in lacking an angulation near the base of the postero-ventral margin of the posterior tibia of the male.

Dallasiellus (Dallasiellus) horvathi NEW SPECIES

DIAGNOSIS: This is a large species with low prosternal carinae and widely-separated small punctures on the scutellar disc.

DESCRIPTION: (described from one female) FEMALE:- oval, widest about midlength. HEAD: length about two-thirds width, 1.69: 2.53; interocular width, 1.43; anterior outline a semicircle, clypeus as long as juga; latter impunctate, with faint radiating rugae and submarginal row of three close-set setigerous punctures in front of eye and two more widely separated distally (right side of head abnormal-?, with only one of preocular series distinct - the one immediately in front of eye); ocelli large, separated from eye by a space little more than transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate polished on apical half, alutaceous and weakly punctate on basal half; antennals, I, 0.53: II, 0.64: III, 0.76: IV, 1.03: V, 1.10; bucculae as high as labial II; labium reaching apices of middle coxae, segments, I, 1.00: II, 1.56: III, 1.36: IV, 1.06. PRONOTUM: length more than half of width, 3.06: 5.71; anterior margin moderately, doubly emarginate; lateral margins narrowing from base, more abruptly so on apical third, with six submarginal setigerous punctures; transverse impression obsolete to absent, marked by medially interrupted, more or less regular row of close-set punctures; laterally both lobes with few punctures. SCUTELLUM: longer than wide, 3.93: 3.57; shining; discally with few, widely scattered small punctures, basal fourth and apex impunctate.

HEMELYTRON: corium and clavus finely alutaceous; clavus with one longitudinal row of punctures; mesocorium with complete row of punctures and basal half of another row paralleling claval suture; exocorium with obsolete but detectable punctures for most of length; membranal suture nearly straight; membrane surpassing apex of abdomen, length more than basal width. PROPLEURON: polished, impunctate except in depression; prosternal carinae low, about half as high as labial II. MESOPLEURON: evaporatorium reaching uninterrupted to lateral margin of segment; lateral area impunctate, with several coarse rugae. METAPLEURON: lateral area with few minute punctures near oblique, weakly concave margin of evaporatorium. STERNITES: polished, impunctate except near spiracular area. LENGTH of body, 10.56.

TYPE DATA: HOLOTYPE female, "Collection Schild-Burgdorf, Costa Rica, Turrialba," with a determination label "Ectinopus holomelas" in what appears to be Heidemann's script. (USNM).

DISTRIBUTION: Known only from the type specimen from Costa Rica.

DISCUSSION: This species is named in honor of the eminent European hemipterist Oesa von Horvath who described several of the other large species of this genus.

Dallasiellus (Dallasiellus) interruptus NEW SPECIES

DIAGNOSIS: The shape of the mesopleural evaporatorium which is interrupted near posterior margin (Fig. 108) not only suggested the name for the species but is also reliable for separating it from all other species within the subgenus, except dilatipes which has highly polished coria.

DESCRIPTION: (from one male and one female) MALE:- oval, widest at

about midlength. HEAD: length about two-thirds of width, 1.56: 2.29; interocular width, 1.36; anterior outline evenly curved, shallowly semicircular, clypeus as long as juga; latter with weak, radiating rugae with moderate punctures in between; submarginal setigerous punctures a row of four close-set punctures in front of eye and one more widely removed distally; ocelli moderately large, separated from eye by space about one-and-a-half times transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate basally alutaceous, weakly punctate; antennals, I, 0.46: II, 0.70: III, 0.56: IV, 0.84: V, 0.95; bucculae as high as labial II; labium reaching between middle coxae, segments, I, 0.96: II, 1.40: III, 1.40: IV, 0.96. PRONOTUM: length more than half of width, 2.79: 5.21; anterior margin deeply and doubly emarginate; side margins entire, not sinuate, with submarginal row of six setigerous punctures; transverse impression weak across full width, marked by punctured band which extends onto posterior lobe at middle; anterior lobe with numerous distinct punctures laterally and few in curved row behind anterior emargination. SCUTELLUM: longer than wide, 3.71: 3.13; polished, impunctate apically and at basal angles, discally with numerous, crowded, coarse punctures becoming finer toward apex. HEMELYTRON: corium and clavus distinctly alutaceous; latter with one complete and basal half of another longitudinal row of punctures; mesocorium and exocorium with numerous punctures over most of surface, former with two complete rows of slightly coarser punctures paralleling claval suture; costa with two setigerous punctures; membranal suture straight; membrane little longer than basal width, very slightly surpassing apex of abdomen. PROPLEURON: weakly alutaceous, punctured only in depression; prosternal carinae very low, sharp. MESOPLEURON: evaporatorium

reaching lateral margin along posterior edge of segment, interrupted near posterior margin of segment by polished band (Fig. 108); lateral area impunctate. METAPLEURON: evaporatorium with outer edge weakly concave; lateral area impunctate. STERNITES: weakly alutaceous, with scattered punctures and short, longitudinal rugae on lateral third. LEGS: moderately long. TERMINALIA: genital capsule entire apically, surface finely punctate in lateral impressed areas; gonostylus as illustrated (Fig. 275). LENGTH of body, 10.27.

FEMALE:- very similar to male. HEAD: length: width:: 1.51:2.29; interocular width, 1.30; antennals, I, 0.43: II, 0.66: III, 0.63: IV, 0.86: V, 0.94; labials, I, 0.95: II, 1.46: III, 1.46: IV, 0.96. PRONOTUM: length: width:: 2.70: 5.21. SCUTELLUM: length: width:: 3.61: 3.24. LENGTH of body, 10.30.

TYPE DATA: HOLOTYPE male, "Unt. Amaz. Taperinha b. Santarem, 1-10, VI, '27, Zerny" in collection of Naturhistorisches Museum, Vienna, Austria (NatMus Wien); ALLOTYPE female, "Prainha, Est. do Para, 6-1-1920, coll. Doris Mender" in collection of Jose C. M. Carvalho, Rio de Janeiro, Brazil.

DISTRIBUTION: This new species is known only from the two types which were from Brazil.

DISCUSSION: The shape of the mesopleural evaporatorium is very suggestive of the condition found in the subgenus Pseudopangaeus, but differs in that the extreme posterior part extends thinly to lateral margin of the segment (Fig. 108) thus definitely allying it to nominal Dallasiellus. It also differs from Pseudopangaeus in having only fine crenulations on the posterior margin of the mesopleuron, in not having the lateral margin of the metapleural evaporatorium deeply concave, and in having the posterior tibia

of the male simple.

Dallasiellus (Dallasiellus) levipennis-prosternalis complex NEW COMBINATION

1883 Geotomus levipennis Signoret, Ann. Soc. Ent. France, 1883:35, pl. 2, fig. 144.

1919 Geocnethus prosternalis Horvath, Ann. Mus. Nat. Hungarici, 17:246.

DIAGNOSIS: The species (?) included in this complex are recognizable among the other large species of the subgenus by having a complete, uninterrupted mesopleural evaporatorium and lobulate prosternal carinae (Fig. 27) which are as high as labial II or higher.

DESCRIPTION: Detailed description not warranted at this time; for comments on structural variations exhibited by specimens refer to discussion below.

TYPE DATA: The types of Signoret's (loc. cit.) levipennis have not yet been located. They were stated to have come from "Cayenne" and "Amazones." Horvath's (loc. cit.) types of prosternalis were from "Brasilia: Minas Geraes . . ., Cuyaba in prov. Matto Grosso." The Cuyaba specimen bears the "Typus" label and is in the collection of the Musee d'Histoire Natruelle de la Hongrie. Drs. Soos and Halaszfy of that institution very generously lent it for study.

DISTRIBUTION: The geographic area from which this group of specimens came is not very extensive, ranging from Panama south to Ecuador and east to Brazil and Venezuela.

DISCUSSION: The ten specimens studied present a number of important variations which the author feels unable to evaluate at this time so he proposes to treat them as members of a "complex." By this is implied that two or more species are included, but that their limits are not evident

from the material and data at hand. Instead of drawing conclusions at this time, the author wishes to simply point out the directions of variation with the hope that additional specimens might come to light to help with this problem.

The head shows several types of variation; 1) anterior outline varies from a flattened semicircle through a full semicircle to a semicircle slightly prolonged anteriorly; 2) surface with no punctures or numerous scattered minute punctures; 3) jugum with submarginal punctures variously arranged with two-close-set punctures in front of eye and two widely-set ones beyond (Fig. 42), or three closely-set ones in front of eye and two widely-set ones beyond, or four or five closely-set ones immediately in front of eye and only one more strongly separated apically (Fig. 43): these sometimes appear in various combinations on the two sides of one individual; 4) labium varying in length from between middle coxae to between posterior coxae. The pronotum agrees in all in having the transverse impression weak but marked with a row of distinct punctures, but the two lobes vary from impunctate laterally to strongly, abundantly punctate; all males showed a decided sinuation of the side margin opposite the ends of the transverse impression. The hemelytron varies in surface texture from highly polished to distinctly alutaceous, and in punctation from impunctate (except for usual row in clavus, one or two rows on mesocorium paralleling claval suture and those in impressions delimiting veins) to punctate apically or for full length of exocorium. The scutellum varied from weakly to very coarsely punctured and in one specimen showed a strong, submarginal carina. The prosternal carinae are strongly lobulate in all, but the shape of this lobe varies from a nearly full semicircle to a shape much longer than broad.

The sternites may be polished or weakly to strongly alutaceous. The male genital capsule is relatively unmodified in all except that in each it shows a weak, triangular impression subapically and punctate laterally. The length of the body varies from 9.6 to 11.9 mm.

Whether these variations have any significance taxonomically remains to be proved. The present author tends to the belief that they do, but he is not yet fully convinced and so attempts no further divisions until additional material is at hand to help evaluate the differences.

SPECIMENS STUDIED: 7 males, 3 females. Until specific differences are established within this complex, there is little value in simply listing the data from the labels of unidentified specimens.

Dallasiellus (Dallasiellus) longulus (Dallas)

1851 Aethus longulus Dallas, List. Hemip. Brit. Mus., 1:119.

1867 Aethus longulus Walker, Catal. Hemip. Brit. Mus., 1:152.

1876 Aethus longulus Stal, Svenska Vet.-Ak. Handl., 14(4):26.

1880 Stenocoris longulus Signoret, Ann. Soc. Ent. France, (5) 10:xliv.

1880 Stenocoris longulus Distant, Biol. Centr.-Amer., Rhynch., 1:5.

1882 Stenocoris longulus Signoret, Ann. Soc. Ent. France, (6) 2:242, pl. 8, fig. 102.

1886 Stenocoris longulus Uhler, Checklist Hemip. N. Am., p. 3.

1891 Dallasia longulus Bergroth, Rev. d'Ent., 10:235.

1893 Stenocoris longulus Lethierry and Severin, Gen. Catal. Hemip., 1:69.

1901 Dallasiellus longulus Berg, Com. Mus. Buenos Aires, 1:281.

DIAGNOSIS: The very elongate, parallel-sided form, or more usable, the long labium which surpasses apices of posterior coxae set this species off from all other members of the genus.

DESCRIPTION: MALE:- elongate, parallel-sided. HEAD: (Fig. 41) length about three-fourths width, 1.25 (1.20-1.30): 1.71 (1.66-1.74); interocular width, 1.04 (1.00-1.08); juga rounded, forming a slightly flattened semicircle, as long as clypeus and distinctly narrowing it apically; jugum carinate marginally, with two submarginal setigerous punctures in addition to one immediately anterior to eyes, these just anterior and one just posterior to midlength; surface weakly convex, faintly rugose radially and with several scattered distinct punctures; ocelli well developed, separated from eye by about twice an ocellar width; jugum ventrally smooth, impunctate; maxillary plate with several distinct punctures, these more abundant posteriorly; antennals, I, 0.39 (0.36-0.38): II, 0.46 (0.44-0.50): III, 0.43 (0.42-0.45): IV, 0.56 (0.53-0.60): V, 0.65 (0.63-0.68); bucculae about as high as labial II; labium reaching to first or base of second sternite, segments, I, 0.70 (0.68-0.73): II, 1.25 (1.16-1.33): III, 1.29 (1.20-1.40): IV, 1.03 (1.00-1.06). PRONOTUM: length more than half of width, 1.92 (1.82-1.95): 3.47 (3.31-3.62); anterior doubly but moderately deeply emarginate; side margins entire, with submarginal row of five setigerous punctures, one of which is posterior to transverse impression; latter slightly behind middle, shallow, interrupted medially, marked by irregular row of distinct punctures; anterior lobe impunctate except in subapical crescentic impression and in wide lateral band; posterior lobe with most punctures grouped at middle. SCUTELLUM: longer than wide, 2.78 (2.73-2.86): 2.18 (2.08-2.24); surface with numerous scattered, irregular punctures absent across base and becoming finer toward impunctate apex. HEMELYTRON: corial areas well defined, surface shining to vaguely alutaceous; exocorium and mesocorium punctured full length, punctures becoming coarser basally,

mesocorium with a complete, sunken row and an incomplete second row of close-set punctures paralleling claval suture; clavus with a single row of punctures; costa with one setigerous puncture; membranal suture nearly straight, outer angle slightly acute. PROPLEURON: punctate in depression; prosternal carinae strongly raised on anterior half of prosternum, in profile forming a somewhat semicircular lobe (Fig. 25). MESOPLEURON: (Fig. 107) evaporative area reaching to postero-lateral angle of segment, thence extended anteriorly along lateral margin; lateral area feebly rugose, impunctate; posterior margin entire. METAPLEURON: (Fig. 107) evaporative area occupying more than mesal three-fourths, lateral margin straight, oblique; lateral area impunctate, with impressed line close to and paralleling outer edge of evaporative area; osteolar canal reaching half way across segment. LEGS: (Figs. 129, 150) not specially modified. STERNITES: shining, laterally roughened by weak rugae and patches of very small tubercles. TERMINALIA: subgenital plate flared laterally near base, apex with a slight emargination; gonostylus as illustrated (Fig. 276). LENGTH of body, 6.91 (6.73-7.14).

FEMALE:- very similar to male; measurements averaging slightly smaller. HEAD: length: width:: 1.18 (1.16-1.20): 1.71 (1.63-1.75); interocular width, 1.05 (1.03-1.10); antennals, I, 0.34 (0.30-0.38): II, 0.47 (0.43-0.50): III, 0.41 (0.39-0.46): IV, 0.56 (0.52-0.60): V, 0.62 (0.60-0.64); labials, I, 0.68 (0.63-0.73): II, 1.28 (1.20-1.33): III, 1.32 (1.26-1.38): IV, 1.02 (1.00-1.03). PRONOTUM: length: width:: 1.87 (1.79-1.95): 3.36 (3.13-3.52). SCUTELLUM: length: width:: 2.76 (2.60-2.86): 2.08 (1.95-2.16). LENGTH of body, 6.87 (6.50-7.16).

TYPE DATA: Dallas' (loc. cit.) type, which is now in the British

Museum of Natural History, originally came from "Para," Brazil.

DISTRIBUTION: The specimens examined had come from Brazil, Bolivia and Paraguay.

DISCUSSION: This species furnishes an excellent example of the superficiality of the approach to genera that has been commonly employed in many of the studies of the Cydnidae. On the basis of a slightly more elongate shape and a lengthened labium, this species served as the type of a monobasic genus. The genus has stood with this single species for more than seventy years, even though several really closely allied species have been described during that period. Many workers have been misled by such specific differences which are more conspicuous in a superficial scanning of a few species at a time than are the more important features of the trichobothria and osteolar peritremes. But such results must be expected when workers are interested in cataloguing and describing all the forms possible--the differences are accorded more importance than are the similarities.

SPECIMENS STUDIED: 5 males, 8 females. BRAZIL: Para, P. R. Uhler Collection, 1m, 2f (USNM). Santarem, 1f (Carn). Unt. Amaz., Taperina b. Santaren, 11-20, VIII, 27, Zearny, 1m (USNM). BOLIVIA: Prov. Sara, Steinbach, 2m, 2f (Carn, MCZ). Puerto Suarez, 150 m., J. Steinbach, Acc. 3845, 1f (Carn). PARAGUAY: Grand Cahco, 59-40 W, 22-23 N, 260 kilm., west Paraguay Riv., XI-10, 1936, Alberto Sculze, 2f (JCL). Villarica, Sept. 1935, F. Schade, 1m (USNM).

Dallasiellus (Dallasiellus) lugubris-reversus COMPLEX

1860 Aethus lugubris Stal, Svenska Vet.-Ak. Handl., 2(7):13.

1883 Geotomus obscurus Signoret, Ann. Soc. Ent. France, (6) 3:39, pl. 2, fig. 147.

1883 Geotomus nigrocinctus Signoret, Ann. Soc. Ent. France, (6) 3:40, pl. 2, fig. 148.

1883 Geotomus semilevis Signoret, Ann. Soc. Ent. France, (6) 3:44, pl. 3, fig. 153.

1932 Geocnethus reversus Barber and Bruner, Bull. Dept. Agr. Puerto Rico, 16:237, pl. 25, fig. 1.

DIAGNOSIS: Within its subgenus this complex may be recognized by the small size, 3.9-5.5, coupled with the presence of two or more close-set setigerous punctures in front of eye on submargin of head and two almost equally developed rows of mesocorial punctures paralleling the claval suture.

DESCRIPTION: not warranted in the present state of uncertainty concerning this group of specimens.

DISTRIBUTION: The range of this complex is from the southern United States south through Central America and the West Indies into Argentina.

DISCUSSION: The above proposed species are considered to belong to this complex, with the oldest and the most recent having been combined to form its name.

The variations shown by the specimens which the key leads to this point are displayed in a frustrating array. The length of body ranges from 3.9 to 5.5. The submarginal setigerous punctures of the head are arranged in patterns of two, three or four close-set ones in front of each eye and with one or two more widely separated ones distally. The two sides of the head of one individual may show different arrangements in almost any combinations, while a series of specimens bearing identical data on their labels often shows differences in this feature. Pronotal variations are

expressed by the transverse impression which may be almost completely absent through obsoletely to weakly impressed laterally or for its entire width. The row of punctures marking the transverse impression is always present but may be regular or irregular, interrupted or not and composed of many close-set or fewer widely spaced punctures. The punctures on the pronotum--laterally on anterior lobe and discally on posterior lobe--also vary greatly in number and a little in diameter. The anterior pronotal lobe may be obsoletely to weakly but distinctly depressed behind the anterior emargination. The punctures of the scutellum and corium likewise vary in density and diameter, but the two mesocorial rows paralleling the claval suture are invariably almost equally developed. The costal punctures may number from one to four, usually, but not always, with the same number on both sides. Ventrally these insects show little variation, even to the male genital capsule which shows only faint differences in depth of the broad V-shaped median emargination of the apical margin. The gonostyli likewise offer no help in separating these specimens, as they appear similar (Fig. 274) in all parts of the geographic range. The above variations all extend uninterrupted from one extreme to another, and occur in unpredictable combinations from one locality to another.

The geographic range, although greater than that known for any other species in the Western Hemisphere, has satisfactory specimen-representation from all its main areas. Some localities are represented by goodly series of specimens. It is in these larger series that the combinations of variations, although appearing to tend in certain directions, are most confusing. This geographic picture is even more complicated by the spotty occurrences of these "tendencies" within groups--i.e., the specimens from

the southern United States appear more similar in combinations to some of the Brazilian groups than to the Mexican or West Indies specimens.

When intense study yields no way to separate this array into definable taxonomic categories, the suspicion arises that perhaps the specimens all belong to one species. Supporting this possibility is the fact that his part of the family represents the least specialized portion. To begin with, Dallasiellus is a "residual" genus that appears at the end of the key after all the more strongly marked genera have been removed. Then, within the genus the specimens under consideration also appear at the end of the key after all the more readily recognized species have been separated off. Thus, a point of relatively little differentiation is reached and further separation becomes very difficult.

Allying all these specimens is the continuous variation and distribution and the similar genital capsule and gonostyli of the males. If investigation of additional characters in the phallosome and the internal female genitalia expose no means for separation, Stal's name lugubris listed above will be the proper one.

SPECIMENS EXAMINED: 39 males, 84 females. The author feels that little could be gained by listing the data of more than 100 unidentified specimens.

Dallasiellus (Dallasiellus) murinus (VanDuzee) NEW COMBINATION

1933 Geotomus murinus VanDuzee, Proc. California Acad. Sci., ser. 4, 21:26.

DIAGNOSIS: Among those species that are less than 6 mm., in length and have three widely separated setigerous punctures on the submargin of the head, this species may be detected by the single setigerous puncture on the costa, the polished mesocorium and the longitudinal impression on each jugum.

DESCRIPTION: (from four males and four females) MALE:- elongate oval, sides subparallel. HEAD: length about two-thirds of width, 0.86 (0.80-0.91): 1.26 (1.22-1.32); interocular width, 0.77 (0.76-0.80); anterior outline semicircular, clypeus as long as jugum, strongly narrowed apically; surface shining, with numerous well scattered minute punctures; jugum with longitudinal, obtuse impression medially, this marked laterally by longitudinal tumid elevation anterior to eye, with three, widely separated setigerous punctures submarginally; ocelli small, separated from eye by space equal to one or one and one-half transverse ocellar widths; jugum ventrally and maxillary plate (except basally) shining, impunctate; antennals, I, 0.28 (0.26-0.30): II, 0.32 (0.30-0.36): III, 0.35 (0.33-0.36): IV, 0.45 (0.42-0.49): V, 0.50 (0.47-0.54); bucculae about as high as labial II, evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.44 (0.43-0.46): II, 0.71 (0.69-0.73): III, 0.54 (0.50-0.60): IV, 0.31 (0.29-0.36). PRONOTUM: length slightly more than half of width, 1.31 (1.23-1.38): 2.55 (2.47-2.60); anterior margin moderately doubly emarginate; lateral margin entire, straight on basal half, with six setigerous punctures submarginally; transverse impression postmedian, distinctly impressed across full width, except sometimes more weakly so medially, marked by regular row of distinct, close-set punctures; subapical impression moderate, with numerous coarse and minute punctures; anterior lobe laterally with mixture of numerous coarse and minute punctures; posterior lobe with numerous widely separated minute punctures over full width and few coarse ones medially and laterally. SCUTELLUM: longer than broad, 1.82 (1.75-1.89): 1.58 (0.49-1.62); shining, with numerous scattered minute punctures, with several coarse ones discally but not across base of apex. HEMELYTRON: clavus and corium polished;

clavus polished, with one complete and sometimes a second partial row of coarse punctures; mesocorium with two complete rows of punctures paralleling claval suture and finer ones scattered widely over disc; exocorium punctured full length, punctures coarser and sparser on mesal half; membranal suture straight, lateral angle not or faintly produced; membrane longer than basal width, reaching or just surpassing apex of abdomen. PROPLEURON: polished, punctate in depression and anterior to acetabulum; prosternal carinae less than half as high as labial II. MESOPLEURON: evaporatorium not interrupted; lateral area impunctate, with obsolete oblique rugae. METAPLEURON: peritreme abruptly terminated apically; lateral margin of evaporatorium weakly concave; lateral area impunctate. STERNITES: shining, with very minute punctures scattered over full width; moderately rugo-punctate in spiracular area. LEGS: not specially modified. TERMINALIA: genital capsule more densely punctate laterally, apical margin broadly and very shallowly emarginate medially; gonostylus as illustrated (Fig. 277). LENGTH of body, 5.23 (5.09-5.41).

FEMALE:- very similar to male, measurements averaging larger: HEAD: length: width:: 0.90 (0.86-0.93): 1.35 (1.31-1.38); interocular width, 0.81 (0.76-0.85); antennals, I, 0.27 (0.26-0.30): II, 0.30 (0.30-0.32): III, 0.34 (0.33-0.38): IV, 0.45 (0.43-0.46): V, 0.53 (0.53-0.54); labials, I, 0.42 (0.40-0.44): II, 0.79 (0.70-1.00): III, 0.53 (0.52-0.56): IV, 0.35 (0.35-0.36). PRONOTUM: length: width:: 1.35 (1.30-1.43): 2.66 (2.51-2.76). SCUTELLUM: length: width:: 1.95 (1.83-2.05): 1.64 (1.50-1.75). LENGTH of body, 5.33 (4.97-5.55).

TYPE DATA: The type female, now in the Collection of the California Academy of Sciences, was from "Tagus Cove, Albermarle Island," in the

Galapagos Islands.

DISTRIBUTION: Specimens studied had come from the Galapagos Islands and from Ecuador, the closest mainland country.

DISCUSSION: The distribution of murinus presents an interesting problem. Here is a species occurring in two areas separated by some 600 miles of ocean barrier. Is its appearance on the Galapagos Islands due to the ocean currents that flow from the mainland to the islands, or was man and his machines the agent of dissemination? Either way, it is interesting to note that Van Duzee's species is not one of the animals of the Galapagos Islands whose range is restricted to them.

SPECIMENS STUDIED: 4 males, 4 females. ECUADOR: Bucay, 3/19/22, G. H. H. Tate Collector, Elevat. 900, 2f (USNM). Guayaquil, 1940, C. L. Fagan, 1m (USNM). GALAPAGOS ISLANDS: Galapagos Is., Pinchot Exp., June, 1929, A. K. Fisher Collector, 2m, 2f (RCF, USNM). Chatham Is., VI-30-1933, 1m (JCL).

Dallasiellus (Dallasiellus) orchidiphilus NEW SPECIES

DIAGNOSIS: This new species is most easily recognized from all other species within the genus by the very short second antennal segment: the latter being distinctly shorter than the first and just about half as long as the third.

DESCRIPTION: MALE:- oval, widest slightly posterior to midlength. HEAD: length about two-thirds width, 0.74 (0.70-0.86): 1.12 (1.10-1.16); interocular width, 0.69 (0.67-0.70); anterior outline less than a semi-circle, clypeus as long as juga and slightly narrowed apically; surface weakly convex, shining, with few minute punctures anterior to each ocellus

and obsolete rugae subapically; jugum with one submarginal setigerous puncture next to eye and one or two short, stout pegs at apex; ocelli small, separated from eye by space almost three times transverse ocellar diameter; jugum ventrally and maxillary plate shining, impunctate; antennals, I, 0.25 (0.23-0.26): II, 0.15 (0.14-0.17): III, 0.31 (0.30-0.33): IV, 0.32 (0.31-0.33): V, 0.41 (0.40-0.43); bucculae almost as high as labial II; labium reaching between middle coxae, segments, I, 0.39 (0.36-0.41): II, 0.57 (0.53-0.61): III, 0.45 (0.43-0.48): IV, 0.32 (0.30-0.36). PRONOTUM: length about half of width, 1.18 (1.10-1.23): 2.39 (2.21-2.53); anterior margin shallowly emarginate; side margin entire, not sinuate, with four or five submarginal setigerous punctures; transverse impression marked by irregular, medially interrupted band of strong punctures; anterior lobe with large punctures paralleling anterior margin and in large patch laterally, and with numerous minute punctures intermixed with large ones to form a line either side of midline and scattered over calli; posterior lobe with scattered large punctures discally and in patch laterally, with few minute punctures scattered over surface. SCUTELLUM: equal to little longer than width, 1.48 (1.36-1.62): 1.45 (1.36-1.55); disc shining, with few coarse punctures or none, and numerous weak, minute punctures. HEMELYTRON: corium and clavus feebly alutaceous; clavus with one row of punctures; mesocorium with distinct punctures scattered over disc and two complete rows paralleling claval suture; exocorium punctured similarly or a little more closely than mesocorium; costa with one setigerous puncture; membranal suture straight, lateral angle not prolonged; membrane about as long as basal width, reaching or slightly surpassing apex of abdomen. PROPLEURON: shining, with few punctures ventrally in depression; prosternal carinae less than half as high

as labial II. MESOPLEURON: evaporatorium reaching into postero-lateral angle but not to lateral margin; lateral area with several distinct punctures. METAPLEURON: peritreme abruptly terminated apically; lateral margin of evaporatorium straight; lateral area impunctate. LEGS: not specially modified. STERNITES: shining, impunctate except near apex of VI. TERMINALIA: genital capsule distinctly punctate except medio-apically, apical margin virtually straight; gonostylus as illustrated (Fig. 278). LENGTH of body, 4.18 (3.93-4.47).

FEMALE:- very similar to male. HEAD: length: width:: 0.69 (0.66-0.73): 1.10 (1.03-1.16); interocular width, 0.68 (0.65-0.71); antennals, I, 0.24 (0.23-0.26): II, 0.14 (0.14-0.16): III, 0.30 (0.28-0.33): IV, 0.35 (0.33-0.37): V, 0.43 (0.40-0.48); labials, I, 0.38 (0.36-0.40): II, 0.56 (0.53-0.60): III, 0.45 (0.44-0.46): IV, 0.34 (0.33-0.35). PRONOTUM: length: width:: 1.17 (1.10-1.33): 2.42 (2.15-2.53). SCUTELLUM: length: width:: 1.49 (1.36-1.63): 1.39 (1.30-1.49). LENGTH of body, 4.08 (3.78-4.63).

TYPE DATA: HOLOTYPE male, "Colombia, on Cattleya, intercepted Honolulu, VII-9-37," and ALLOTYPE female, "Colombia, on orchid, intercepted San Francisco, Cal., II-1-39," both in the collection of the United States National Museum. PARATYPES: Colombia, on orchids, inspect. house, D. C., I-13-40, 1m (USNM); Colombia, S. A., 9-25-40, on orchids, Hoboken, N. J., 1m (USNM); Colombia, on orchid, Inspe. H, D. C., VI-7-38, 1m (RCF); Bogata, Columbia (sic), Nov. 30, 1921, F. H. B. #32857, 1m (USNM); Colombia, in orchids, Inspect. H., D. C., XI-14-36, 1f (USNM); Columbia (sic), VIII-22-45, intercept. San Franc., Cattleya Mendell, 1f (USNM). PANAMA: Summit, Panama C. Z., I-1947, N. L. H. Krauss, 1f (USNM).

DISTRIBUTION: If the localities of interception are not considered,

the present species, D. orchidiphilus, is known from Colombia and the adjacent isthmus of Panama.

DISCUSSION: The trivial name was given on the basis of the numerous interceptions of this form on "orchids." The several specimens for which the host orchid was determined all came from Cattleya, a tree-inhabiting orchid genus. This habit of frequenting an orchid that grows on trees probably accounts in great part for the fact that only two of the nine specimens seen had been collected in their native haunts; the other seven were found in a specialized form of collecting in which the orchids were examined after having been shipped from their country of origin. Collecting on Cattleya in Central and South America should yield many more specimens.

Dallasiellus (Dallasiellus) ovalis NEW SPECIES

DIAGNOSIS: Among the smaller species (not over 5.5) with the three widely separated setigerous punctures in front of the eye, this species may be recognized by the lack of costal setigerous punctures and the obsolete transverse pronotal impression.

DESCRIPTION: (based on three females) FEMALE:- oval. HEAD: length two-thirds of width, 0.80 (0.76-0.83): 1.24 (1.23-1.26); interocular width, 0.78 (0.76-0.81); anterior outline a flattened semicircle, clypeus as long as juga, narrowed apically; surface shining, impunctate, with three widely-separated submarginal setigerous punctures; ocelli small, separated from eye by space more than three times transverse ocellar width; jugum ventrally and maxillary plate, except basal third, polished, impunctate; antennals, I, 0.20 (0.20-0.20): II, 0.20 (0.20-020): III, 0.29 (0.26-0.33): IV, 0.36 (0.36-0.36): V, 0.47 (0.47-0.48); bucculae almost as high as

labial II; labium reaching between middle coxae, segments, I, 0.43 (0.40-0.45): II, 0.70 (0.70-0.72): III, 0.54 (0.50-0.60): IV, 0.32 (0.30-0.33). PRONOTUM: length more than twice width, 1.36 (1.36-1.38): 2.47 (2.44-2.53); anterior margin shallowly, singly emarginate; side margins entire, straight on basal two-thirds, with four or five submarginal setigerous punctures; transverse impression postmedian, obsolete, marked by very irregular row of numerous punctures; both lobes laterally with numerous punctures; anterior lobe with curved row of punctures paralleling anterior emargination; posterior lobe with distinct punctures scattered across most of disc. SCUTELLUM: longer than wide, 1.73 (1.12-1.90): 1.51 (1.49-1.56); disc polished, with a number of well-separated moderate punctures becoming finer apically. HEMELYTRON: clavus and corium polished; clavus with two longitudinal rows of punctures; mesocorium coarsely punctured toward base, more finely and sparsely so toward apex, with two complete rows of punctures paralleling claval suture; exocorium with punctures crowded for full length; costa with no setigerous punctures; membranal suture straight, lateral angle faintly prolonged; membrane longer than basal width, slightly surpassing apex of abdomen. PROPLEURON: shining, punctate only in depression; prosternal carinae less than half as high as labial II. MESOPLEURON: lateral area impunctate, lightly obliquely rugose. METAPLEURON: peritreme abruptly terminated apically; lateral margin of evaporatorium straight to faintly convex; lateral area impunctate. STERNITES: polished, impunctate, with few short, longitudinal rugae in spiracular area. LEGS: not specially modified. LENGTH of body, 4.79 (4.65-4.92).

TYPE DATA: HOLOTYPE female, "Nova Teutonia, Santa Catarina, Brazil, X-16, 1950, F. Plaumann," in collection of John C. Lutz, Philadelphia,

Pennsylvania. PARATYPES: same data as type, 1f (JCL); same locality and collector as type, VIII-15-35, 1f (RLU).

DISTRIBUTION: D. ovalis is at present known only from the type locality in southern Brazil.

DISCUSSION: None of the specimens examined bore any biological data.

Dallasiellus (Dallasiellus) planicollis (Horvath) NEW COMBINATION

1919 Geocnethus planicollis Horvath, Ann. Mus. Nat. Hungarici, 17:247.

DIAGNOSIS: Among the large species which make up the group centering about bergi (key couplets 7 to 9), this species may be recognized by a combination of several characters: 1) low prosternal carinae, 2) corium alutaceous and with but a few exocorial punctures which are confined to apex, and 3) the numerous coarse, scutellar punctures.

DESCRIPTION: (based on one specimen, the type male): MALE:- oval. HEAD: broader than long, 2.25: 1.43; interocular width, 1.30; clypeus as long as juga, slightly narrowed at apex; juga longitudinally impressed medially, with four submarginal setigerous punctures; two close-set ones in front of eye and two widely-spaced ones beyond; ocelli large, width subequal to space separating them from eye; antennals, I, 0.45: II, 0.60: III, 0.63: IV, 0.91: V, missing; maxillary plate punctate on basal half; bucculae moderately high; labium reaching between middle coxae, segments, I, 1.05: II, 1.33: III, 1.20: IV, 0.88. PRONOTUM: wider than long, 5.21: 2.83; sides tapering from base, markedly sinuate medially; anterior margin deeply emarginate, with a bordering broad, punctate impression; transverse impression slightly behind middle, vaguely impressed, with an irregular row of coarse punctures that curve forward medially; anterior lobe with a few

punctures laterally; posterior lobe impunctate except for few moderate punctures medially; prosternal carinae low, in profile angulately rounded. SCUTELLUM: longer than wide, 3.42: 3.28; discally with more than thirty-five coarse, sunken punctures crowded to form coarse, transverse rugae between them. HEMELYTRON: corium finely but distinctly alutaceous; exocorium with few moderate punctures near base and apex; mesocorium impunctate except for rows bordering claval suture; clavus with one complete and one incomplete row of punctures; costa with two setigerous punctures; membrane reaching apex of abdomen, longer than basal width. MESOPLEURON: evaporatorium reaching uninterrupted to postero-lateral angle of segment; posterior margin entire. METAPLEURON: lateral margin of evaporatorium gently concave. LEGS: posterior femur not tuberculate medio-ventrally; posterior tibia simple. STERNITES: polished, impunctate, except along basal margin and near spiracles. TERMINALIA: genital capsule with posterior margin faintly emarginate either side of broad, blunt apex; gonostylus as illustrated (Fig. 280). LENGTH of body, 10.35.

TYPE DATA: The original locality given by Horvath (1919:247), "Brasilia: Rio de Janeiro," agrees with the data on the male type in the Musee d'Histoire Naturelle de la Hongrie. The type was very generously lent to the author for study by Drs. Soos and Halaszfy of that institution.

DISTRIBUTION: To date, the type specimen was the only one seen.

DISCUSSION: This species, like most of the other large sized species of the subgenus (in couplets 7-9 of the key to species), is represented by very limited material--one specimen in this case. With such limited material the worker has little chance to evaluate the differences that do appear. Until more specimens become available these species must be accepted.

SPECIMENS EXAMINED: 1 male (the type). BRAZILIA: Rio, labelled as "Typus" of Geocnethus planicollis Horvath, 1m (Hung).

Dallasiellus (Dallasiellus) puncticeps NEW SPECIES

DIAGNOSIS: The coarse, close-set punctures on the surface of the head plus the abrupt posterior termination of the bucculae mark puncticeps from all others in the subgenus.

DESCRIPTION: (based on one male) MALE:- elongate oval, almost parallel-sided, widest behind midlength. HEAD: length almost two-thirds of width, 1.16: 1.81; interocular width, 1.03; anterior outline semicircular, juga longer than and contiguous beyond clypeus; surface depressed either side of midline, coarsely and subrugosely punctate over most of surface posteriorly to ocellar area; jugum with one setigerous puncture immediately anterior to eye; ocelli large, separated from eye by space subequal to transverse diameter of ocellus; jugum ventrally polished, impunctate; maxillary plate coarsely punctured, more densely so on basal third; antennals, I, 0.38: II, 0.50: III, 0.53: IV, 0.64: V, 0.79; bucculae much higher than labial II, abruptly and roundly terminated posteriorly; labium reaching past middle of mesosternum, segments, I, 0.61: II, 1.02: III, 0.88: IV, 0.79. PRONOTUM: length less than half of width, 2.06: 4.36; anterior margin shallowly, singly emarginate; side margin entire, somewhat flattened on middle third, with submarginal row of four or five setigerous punctures; transverse impression median, obsolete, emphasized anteriorly by slightly tumid calli, with irregular row of large punctures; anterior lobe with crowded large punctures in band paralleling anterior emargination, in broad lateral area and in small patch on midline; posterior lobe with numerous

punctures becoming finer posteriorly, absent on hind margin and umbone. SCUTELLUM: longer than wide, 3.26: 2.47; disc polished, punctured over full length, more finely so toward apex. HEMELYTRON: clavus and corium obsoletely alutaceous; clavus with double row of punctures on basal half, single row beyond; mesocorium distinctly punctured over full length, more densely so apically, with two rows of punctures paralleling claval suture, outer row of more widely separated punctures; exocorium for full length more densely and coarsely punctate than mesocorium; costa without setigerous punctures; membranal suture weakly bisinuate, lateral angle slightly produced; membrane longer than basal width, surpassing abdomen by about one-fourth its length. PROPLEURON: polished, with few coarse punctures in depression and smaller punctures on posterior convexity and anterior convexity laterally; prosternal carinae about half as high as labial II. MESOPLEURON: evaporatorium reaching lateral margin in postero-lateral angle; lateral area longitudinally rugo-punctate. METAPLEURON: peritreme abruptly terminated apically; evaporatorium delimited laterally by impressed line; lateral area impunctate. STERNITES: weakly alutaceous, with minute punctures scattered over most of surface and coarser ones laterally. LEGS: posterior femora ventrally with numerous transverse tubercles basad of large, blunt, subapical angulation; posterior tibiae elongate, about one-and-a-half times as long as femora, slender and gently curved in apical half. TERMINALIA: genital capsule alutaceous, with numerous fine punctures over most of surface, apical margin with broad, weak emargination medially; gonostylus as illustrated (Fig. 281). LENGTH of body, 8.85.

TYPE DATA: HOLOTYPE male, "Espirito-Santo, Brasil, ex coll. Fruhstorfer," in the collections of the Naturhistorisches Museum in Vienna, Austria.

DISTRIBUTION: Known only from the single Brazilian type listed above.

DISCUSSION: The trivial name of this new species obviously refers to the very strongly punctured head, a character shared with only one other species, solitarius, within the subgenus.

Dallasiellus (Dallasiellus) solitaria (Horvath) NEW COMBINATION

1919 Colobophrys solitaria Horvath, Ann. Mus. Nat. Hungarici, 17:244.

DIAGNOSIS: Within the genus this species may be most readily recognized by the coarsely rugo-punctate head and the posteriorly evanescent bucculae.

DESCRIPTION: MALE (based on three specimens):- oblong-oval. HEAD: length two-thirds of width, 1.42 (1.36-1.49): 1.98 (1.95-2.02); interocular width, 1.10; juga shallowly curved, forming an elongate semicircle, as long as clypeus; jugum with a single, submedian on submargin anterior to anteocular seta; surface longitudinally convex, jugum and vertex very closely, rugosely punctured; ocelli large, wider than space separating them from eye; jugum ventrally polished, impunctate; maxillary plate anteriorly to antennal insertion polished, with one or two distinct punctures; posteriorly cribately punctured; antennals, I, 0.55 (0.53-0.60): II, 0.68 0.66-0.70): III, 0.64 (0.60-0.66): IV, 0.92 (0.92-0.96): V, 1.14 (1.13-1.16); bucculae higher than labial II, mostly cribately punctured, abruptly evanescent posteriorly; labium reaching between middle coxae, segments, I, 0.77 (0.70-0.80): II, 1.25 (1.25-1.26): III, 0.92 (0.90-0.96): IV, 0.68 (0.66-0.70). PRONOTUM: width more than twice length, 4.50 (4.35-4.70) 2.21 (2.13-2.28); anterior margin broadly but shallowly emarginate; lateral margins strongly and broadly emarginate at ends of transverse groove, the carinate

margin immediately posterior to emargination appearing reflexed and thickened, posterior fifth of lateral margin obliquely truncated and causing margin to appear angled prebasally; lateral submargin of anterior lobe with four and prebasal angle laterally on posterior lobe with one setigerous puncture; transverse impression submedian, shallow, irregular, interrupted laterally by oblique fold extending mesally from lateral constriction; entire surface, except curved calli areas, with numerous, close-set punctures. SCUTELLUM: longer than wide, 3.55 (3.45-3.60): 2.74 (2.71-2.79); surface shining, with abundant, crowded punctures over all but apex, with a feeble, interrupted suggestion of a median carina; apex slightly inflated; impunctate and unusually acute. HEMELYTRON: clavus and corium strongly alutaceous, distinctly duller than pronotum and scutellum; corial areas well defined, disc and exocorium with scattered weak punctures, former with two complete rows of close-set punctures paralleling claval suture; costa flattened, acute, reflexed on basal two-thirds, with numerous fine punctures and with two coarser setigerous punctures on basal half; costa weakly sinuate posterior to subbasal setigerous puncture; membranal suture bisinuate, lateral angle acute; membrane slightly longer than basal width, surpassing apex of abdomen. PROPLEURON: coarsely and closely punctured at antero-ventral angle and in depression, more sparsely and weakly so posterior to depression; prosternal carinae thick, blunt, low. MESOPLEURON: evaporatorium reaching uninterrupted into postero-lateral angle; polished area variously rugose and punctured. METAPLEURON: evaporatorium occupying mesal four-fifths of segment, lateral margin paralleling side of segment; osteolar canal extending about half way across segment. LEGS: long, slender. STERNITES: dull, distinctly alutaceous. TERMINALIA: subgenital plate

slightly compressed laterally; with a broad, low, blunt tubercle, medially immediately below apical margin; gonostylus as illustrated (Fig. 282). LENGTH of body, 9.40 (9.15-9.57).

FEMALE:- similar to male, except pronotum laterally with only a weak sinuation at ends of transverse impression and no reflexed carinate margin and no oblique furrow projecting mesally on disc. HEAD: length: width:: 1.42 (1.36-1.49): 2.01 (1.92-2.11); interocular width, 1.17 (1.12-1.23); antennals, I, 0.54 (0.50-0.60): II, 0.65 (0.63-0.70): III, 0.65 (0.64-0.66): IV, 0.92 (0.88-0.96): V, 1.14 (1.13-1.16); labials, I, 0.79 (0.73-0.83): II, 1.24 (1.21-1.26): III, 0.95 (0.93-0.96): IV, 0.67 (0.63-0.70). PRONOTUM: length: width:: 2.25 (2.15-2.28): 4.67 (4.35-4.91). SCUTELLUM: length: width:: 3.58 (3.30-4.01): 2.71 (2.50-3.00). LENGTH of body, 9.39 (9.00-9.42).

TYPE DATA: Horvath (loc. cit.) gave the type locality as "Peru: Marcapata." The type female, now in the collection of the Musee d'Histoire Naturelle de la Hongrie, has the same data. Drs. Soos and Halaszfy were kind enough to lend the type for study.

DISTRIBUTION: All specimens seen were from Peru.

DISCUSSION: At the time of the original description of this species it served as the genotype of Horvath's new genus Colobophrys (see discussion under Dallasiellus for reasons for synonymyzing the two). The description of the sternites as being smooth is inaccurate, they are really strongly alutaceous.

SPECIMENS STUDIED: 4 males, 9 females. PERU: Marcapata, 1f, labelled as "Typus" of Colobophrys solitaria Horvath (Hung). Santa Isabel, Dept. Cuzco, Valley of River Ccosinpata, I-1, 1952, XI-30, 1951, XII-3 & 25,

1951, F. Woytkowski, 4m, 8f (JCL).

Dallasiellus (Dallasiellus) triangularis NEW SPECIES

DIAGNOSIS: Among the smaller species of the subgenus this species may be marked by the impunctate scutellar disc and the presence of two complete rows of mesocorial punctures paralleling the claval suture.

DESCRIPTION: (described from one female) FEMALE:- oval, slightly elongate. HEAD: length more than half of width, 0.76: 1.33; interocular width, 0.76; anterior outline semicircular, clypeus as long as juga and only slightly narrowed apically; surface polished, impunctate; jugum with two adjacent setigerous punctures next to eye and two more widely-spaced beyond; ocelli moderately large, separated from eye by about twice a transverse ocellar width; jugum ventrally and apical two-thirds of maxillary plate polished, impunctate; antennals, I, 0.23: II, 0.26: III, 0.36: IV, 0.48: V, 0.60; bucculae as high as labial II; labium reaching onto mesosternum, segments, I, 0.50: II, 0.83: III, 0.63: IV, 0.40. PRONOTUM: length little more than half of width, 1.49: 2.73; anterior margin moderately and singly emarginate; lateral margin mostly straight, with six submarginal setigerous punctures; transverse impression postmedian, very weak, marked by medially interrupted, irregular or double row of mostly well separated punctures; anterior lobe impunctate except for almost straight row immediately behind anterior emargination; posterior lobe impunctate except for very few punctures on disc. SCUTELLUM: longer than wide, 1.89: 1.56; disc polished, virtually impunctate. HEMELYTRON: clavus and corium polished; clavus with partial longitudinal rows of punctures; meso- and exocoria impunctate except at apex on two complete rows paralleling claval

suture; costa with two setigerous punctures; membranal suture straight, lateral angle not produced; membrane longer than basal width, reaching tip of abdomen. PROPLEURON: punctate only in depression; prosternal carinae as high as labial II, in profile acutely triangular with apex ventrally. MESOPLEURON: lateral area impunctate, weakly rugose. METAPLEURON: peritreme abruptly terminated apically; lateral area polished, with a row of punctures delimiting lateral margin of evaporatorium. STERNITES: polished, impunctate except laterally near posterior margin of sternite VI. LEGS: not specially modified. LENGTH of body, 5.25.

TYPE DATA: HOLOTYPE female, "British Guiana: Essequibo R., Moraballi Creek, 14-viii, 1929, Oxf. Univ.Expedn., B. M. 1929-485," in the British Museum of Natural History.

DISTRIBUTION: This species is known only from the type female from British Guiana.

DISCUSSION: The peculiar, acutely triangular prosternal carinae appear to be unique within the genus and suggested the trivial name used above.

Dallasiellus (Dallasiellus) viduus (Stal) NEW COMBINATION

1862 Aethus viduus Stal, K. Svensk Vet. Akad. Handl., 2(7):13.

1867 Aethus viduus Walker, Catal. Hemip. British Mus., 1:153.

1876 Macroscytus viduus Stal, Svenska Vet.-Ak. Handl., 1:19.

1883 Geotomus viduus Signoret, Ann. Soc.Ent. France, (6) 3:45, pl. 3, fig. 154.

1893 Geotomus viduus Lethierry and Severin, Gen. Catal. Hemip., 1:74.

DIAGNOSIS: The absence of large punctures on the disc of the scutellum plus the presence of but one submarginal setigerous puncture on each jugum

will separate viduus from all others in the subgenus.

DESCRIPTION: (from two males and three females) MALE:- elongate-oval. HEAD: length more than half of width, 0.64 (0.64-0.65): 1.04 (1.03-1.06); interocular width, 0.64 (0.63-0.65); anterior outline subsemicircular, clypeus as long as juga, somewhat narrowed apically; surface slightly convex, impunctate; jugum with one submarginal setigerous puncture immediately anterior to eye; ocelli moderate, separated from eye by a space about two times transverse ocellar width; jugum ventrally polished, impunctate; maxillary plate alutaceous and with few punctures on basal third; antennals, I, 0.21 (0.20-0.23): II, 0.23 (0.20-0.26): III, 0.33 (0.32-0.34): IV, 0.33 (0.30-0.36). PRONOTUM: length about half of width, 1.17 (1.17-1.17): 2.23 (2.18-2.29); anterior margin shallowly, singly emarginate; lateral margin weakly sinuate opposite ends of transverse impression; latter submedian, sharply impressed across full width, marked by entire row of very close-set large punctures; surface with several scattered, minute punctures and a row of coarser ones on anterior lobe paralleling anterior emargination, and several coarse ones discally on posterior lobe. SCUTELLUM: longer than wide, 1.52 (1.49-1.56): 1.26 (1.25-1.28); discally polished, with scattered minute punctures but no large ones. HEMELYTRON: clavus and corium feebly alutaceous; clavus with one longitudinal row of coarse punctures; mesocorium obsoletely punctured except for one row of close-set distinct punctures paralleling claval suture; exocorium without distinct punctures; costa without setigerous punctures; membranal suture weakly sinuate, lateral angle not produced; membrane longer than basal width, surpassing apex of abdomen. PROPLEURON: with few distinct punctures in depression; prosternal carinae less than half as high as labial II.

MESOPIEURON: evaporatorium reaching into postero-lateral angle, not attaining lateral margin; lateral area impunctate, somewhat depressed apically. METAPIEURON: lateral margin of evaporatorium virtually straight; lateral area polished, impunctate. STERNITES: shining, very weakly alutaceous, impunctate. LEGS: not specially modified. TERMINALIA: genital capsule distinctly punctured laterally, apical margin broadly but shallowly concave; gonostylus as illustrated (Fig. 283). LENGTH of body, 4.33 (4.20-4.47).

FEMALE:- similar to male, but side margins of pronotum not sinuate, measurements averaging larger. HEAD: length: width:: 0.74 (0.71-0.80): 1.17 (1.13-1.23); interocular width, 0.70 (0.70-0.71); antennals, I, 0.26 (0.25-0.28): II, 0.27 (0.26-0.28): III, 0.37 (0.36-0.40): IV, 0.46 (0.46-0.46): V, 0.60 (only one specimen with terminal segment); labials, I, 0.37 (0.36-0.39): II, 0.69 (0.67-0.70): III, 0.56 (0.53-0.60): IV, 0.34 (0.33-0.36). PRONOTUM: length: width:: 1.36 (1.31-1.43): 2.50 (2.43-2.60). SCUTELLUM: length: width:: 1.69 (1.48-1.82): 1.56 (0.56-1.57). LENGTH of body, 4.84 (4.63-5.09).

TYPE DATA: Stal's (loc. cit.) original locality was given as "Rio Janeiro," Brazil. The type is in the collection of the Naturhistoriska Riksmuseum in Stockholm, Sweden. It was kindly lent to the author for study by Dr. Malaise of that institution.

DISTRIBUTION: All specimens studied were from southern Brazil.

DISCUSSION: Personal study of the type left no doubt in the author's mind about the identity of this form.

SPECIMENS STUDIED: 2 males, 3 females. BRAZIL: Brasilia, Coll. Brancsik, 1f (Hung). Blumenau, Hetschko, 89, 1m (Vienna). D. Federal,

Carvalho Col., lm (Carv). Rio de Jan., Acc. No. 2966, Nov., lf (Carn).

Rio Doce, Minas Gereas, 1030, Mrs. Y. Mexia collector, lf (CalAc).

SUBFAMILY AMNESTINAE HART NEW STATUS

1919 Amnestini Hart, Bull. Ill. Nat. Hist. Surv., 13:204.

DIAGNOSIS: The most prominent feature which may be relied upon to separate this subfamily from all others within the family Cydnidae is the presence of a claval commissure. No other group of Cydnidae shows a claval commissure.

DESCRIPTION: ANTENNAE: four- or five-segmented. SCUTELLUM: short, not reaching apices of clavi, latter forming a distinct claval commissure posterior to scutellar apex. THORACIC PLEURAE: (Fig. 113) posterior margins of all segments well-developed; propleuron with posterior convexity low; mesopleuron with posterior margin touching or overlapping metapleuron for most of width; metapleuron covering posterior coxa, posterior margin expanded as a free, triangular lamella which laterally covers sides of sternites I-III. LEGS: male with secondary sexual characters in form of strongly modified spines and angulations on femora and/or tibiae; female without secondary sexual modifications of legs; tarsus present on all legs, II subequal in thickness to I and III. STERNITES: (Fig. 173) sutures entire, not emarginate laterally; sternites III and IV without trichobothria, V to VII each with a single trichobothrium located posterior to the spiracle. TERMINALIA: male, genital capsule opening posteriorly (Fig. 179); female plates small, anus completely surrounded by an undivided triangular plate (Fig. 185).

TYPE OF SUBFAMILY: genus Amnestus Dallas (1851).

DISTRIBUTION: The distribution of this subfamily is that of its sole genus, Amnestus, and extends from the northern United States south to central Argentina.

DISCUSSION: The presence of a distinct claval commissure is a very unusual feature in the Pentatomoidea. Usually the scutellum is enlarged so as to surpass the apices of the clavi and prevent their coming together. This condition plus the trichobothrial arrangement, strongly lamellated posterior margin of the metapleuron and the unusual secondary sexual modifications of the legs of the males set this genus apart from all the other Cydnidae studied and support the elevation of Hart's tribe Amnestini to full subfamily position.

Biologically the Amnestinae are known only from fragmentary notes that have appeared in scattered publications. A generalized life cycle deduced from these notes, data on specimens and personal observations may be outlined here: adults hibernate and so probably lay eggs on again becoming active in spring; both nymphs and adults are root-feeders, with the preferred habitat apparently under moister conditions. This latter is surmised from the fact that the adults, which come freely to lights, are collected most abundantly at lights along bodies of water (i.e., bridge and dock lights, stream-side cottages, etc.). This preference for a moister habitat is confirmed by such published statements as, "on weeds in slough," Creve Couer (1905:233) and "on low vegetation along streams," Blatchley (1926:87). The number of generations per year is not indicated by data at hand.

The subfamily contains the single genus which is treated below.

Genus Amnestus Dallas

1851 Amnestus Dallas, List. Hemip. Brit. Mus., 1:126.

1860 Magoa Stal, Svenska Vet.-Ak. Handl., 2(7):13.

1883 Pachymeroides Signoret, Ann. Soc. Ent. France, (6) 3:365. NEW SYNONYMY

DIAGNOSIS: Because this is the only genus in the subfamily, it can readily be recognized by any of the features pointed out above for subfamily recognition.

DESCRIPTION: Small, 1.6-4.5, subparallel to oval, dorsum much less convex than venter. HEAD: strongly deflexed, wider than long, clypeus as long as or longer than juga; clypeus with four apical, marginal pegs, except in sexdentatus new species in which two additional pegs are present; juga with four or five, rarely more, pegs marginally; ocelli well-developed, posterior to line connecting hind margins of eyes; primary setigerous punctures usually eight in number (Fig. 59), two near anterior margin of each eye and two on midline of jugum; jugum ventrally and maxillary plate impunctate; antennae five-segmented (described as four-segmented for Pachymeroides bolivari Signoret, but available material of this species shows five segments), II minute, III, IV and V subequal; bucculae well developed, about one-third length of labial I; labium variable in length, reaching to middle of mesosternum or all the way to sternite III, II compressed, without foliaceous lobe. PRONOTUM: subquadrate to transverse; anterior margin feebly to strongly concave; lateral margins subparallel on basal half or converging from base, broadly rounded on apical half, with submarginal row of not more than twelve setigerous punctures; transverse impression postmedian, weak to strong; posterior margin weakly convex, sinuate laterally near umbones; anterior lobe usually distinctly tumid in male, not so in

female, variously punctate; posterior lobe punctate, punctures becoming finer posteriorly. SCUTELLUM: triangular, wider than long, apex acute, not narrowed; disc shining, coarsely punctate. HEMELYTRON: corial areas well defined; membranal suture deeply emarginate on inner half, lateral angle acute; clavus with three rows of distinct punctures; mesocorium with two rows of punctures paralleling claval suture, variably punctured elsewhere; membrane hyaline to faintly yellowed, comprising a third or more of hemelytral length, surpassing apex of abdomen by one-half its length. PROPLEURON: row of coarse punctures in depression; prosternal carinae well developed. MESOPLEURON: (Fig. 113) evaporatorium occupying entire area; posterior margin entire, straight to moderately prolonged at postero-lateral angle. METAPLEURON: (Fig. 113) evaporatorium occupying entire area; peritreme transverse, elongate, trough-shaped, slightly curved, reaching two-thirds to three-fourths of way to lateral margin of segment; metasternum carinate, projecting between posterior coxae. LEGS: moderately long; in male with various secondary sexual characteristics in the form of spines and angles on femora and tibiae (Figs. 160-164); in female without such modifications; anterior tibia distinctly compressed, expanded, dorsally with row of seven stout spines set on tubercles. STERNITES: strongly convex, shining, with abundant long, golden hairs arising from fine punctures.

Nymphs of this genus in the second to fifth instars (first not available for study) can be recognized by the row of stout pegs on the margin of the head—in this respect being like the adults.

GENOTYPE: Cydnus spinifrons Say (1825:316), monobasic; of Magoa Stal, Magoa cribrata Stal (1860:14), here designated; of Pachymeroides Signoret, Pachymeroides bolivari Signoret (1883:366), monobasic.

DISTRIBUTION: Amnestus is a neogeic[1] genus which is known to range from Maine and Ontario west to Colorado, thence south through Central America and the West Indies into South America as far south as Buenos Aires, Argentina.

DISCUSSION: The synonymy of Magoa with Amnestus has long been accepted and is supported by present findings which included study of the types of all the species that Stal originally included in Magoa. The synonymy of Pachymeroides with Amnestus is here proposed on the basis of study of thirteen specimens of what appears to be Signoret's species P. bolivari. Unfortunately, only one front leg and one middle leg are all that remains of the specimen of bolivari in Signoret's collection but these specimens agree with them. They also agree in a general way with the original description and illustration (see treatment of bolivari for more comments on this point) but actually show the presence of a minute second antennal segment and the development of the meso- and metapleural evaporatoria that will mark the species as an undoubted member of the genus Amnestus.

Until corrected by Hart (1919), workers generally had the sexes of the members of this genus confused. They described the females as having prominent spines on the ventral surface of the femora, whereas these secondary sexual modifications in reality belong to the males. The males also generally have the anterior lobe of the pronotum more tumid than do the females.

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[1] One specimen of pusio (Stal) in the collection of the Museum of Comparative Zoology labelled "Madagascar." Surely, this is a case of mislabelling, or at most a stray specimen carried into that part of the world by the agency of man.

Key to the Species of *Amnestus*

1. Jugum with five (rarely more) marginal pegs (Fig. 61). 2
   Jugum with four marginal pegs (Fig. 64). 14
2. Clypeus surpassing juga by a length equal to or greater than its own width. . . . . *uhleri* Dist. p. 501
   Clypeus not or only slightly surpassing (by less than own width) juga. 3
3. Labium long, reaching or surpassing base of abdomen. . . . . *spinifrons* (Say) p. 495
   Labium short, not surpassing middle coxae. 4
4. Exocorium with costal half hyaline, impunctate or very feebly punctate; prosternal carinae (in profile) concave ventrally (Fig. 40). . . . . *championi* Dist. p. 469
   Exocorium uniformly punctate across full width. 5
5. Umbones distinctly, closely punctate 6
   Umbones polished, mostly impunctate. 7
6. Prosternal carinae (in profile) distinctly concave ventrally (as in Fig. 40); pronotum unicolorous blackish-brown. . . . . *cribratus* (Stal) p. 471
   Prosternal carinae not concave ventrally; posterior pronotal lobe yellow like coria, distinctly paler than brown anterior lobe. . . . . *forreri* Dist. p. 476
7. Clypeus with six apical pegs, the usual marginal four plus two on midline, one above and one below margin; posterior pronotal lobe distinctly lighter than anterior lobe. . . . *sexdentatus* n.sp. p. 493

Clypeus with not more than four apical pegs. 8

8. Prosternal carinae (in profile) vertical anteriorly (Fig. 38). . .
. . . . . .subferrugineus (Westw.) p. 498

Prosternal carinae rounded, not vertical anteriorly. 9

9. Prosternal carinae about twice as high as labial II, semicircular, with prominent, deep fovea laterally near base (Fig. 39) . . . . .
. . . . . foveatus n.sp. p. 478

Prosternal carinae distinctly lower than labial II, without fovea. 10

10. Corium with longitudinal brownish line along radial vein extending to costa along apical margin; umbones distinctly paler than remainder of pronotal disc. . . . . .radialis n.sp. p. 492

Corium without brownish line along radial vein; umbones concolorus with remainder of pronotum 11

11. Coria on basal half or more yellow, distinctly paler than brownish pronotum and scutellum. 12

Coria concolorous with reddish-brown pronotum and scutellum. . . .
. . . . . pallidus Zimm. p. 482

12. Lateral pronotal margin slightly but distinctly concave at basal fourth; corium becoming fuscous on apical third or more. . . . .
. . . . . brunneus Sign. p. 466

Lateral pronotal margin straight on basal half; corium uniformly yellow. . . . . lautipennis (Stal) p. 480

14. Pronotal umbones prominently, closely punctate . bolivari (Sign.) p.463

Pronotal umbones in great part not punctate 15

15. Male: subapical ventral spine of posterior femur more than one-third length of tibia (Fig. 164). Female: last sternite with medially flattened, glabrous area delimited laterally by partial or complete, obtuse, longitudinal carinae (Fig. 184). . . . . .pusillus Uhl. p. 485

Male: subapical ventral spine of posterior femur shorter than vertical height of femur. Female: last sternite without flattened glabrous area or if present, not so delimited laterally. 16

16. Middle third of costa narrowly expanded, reflexed, forming shallow trough nearly as wide as middle tibia. . . . .explantus n.sp. p. 474

Corium convex to margin, neither explanate nor reflexed in median third. 17

17. Clypeus convex, with prominent, transverse rugae; coria with obscure fuscous cloud across middle and at apex . . . . . diminuatus Barb. p. 473

Clypeus not transversely rugose; coria unicolorous hyaline-yellow. 18

18. Male: anterior tibia with distinct subbasal spine ventrally (Fig. 132). . . . . basidentatus n.sp. p. 461

Male: anterior tibia without subbasal spine ventrally. . . . . pusio (Stal) p. 489

Amnestus basidentatus NEW SPECIES

DIAGNOSIS: The males of this species can be separated from males of all others in the genus by the distinct subbasal spine on the ventral margin coupled with short, ventral, subapical spine on posterior tibia. The

females of this species and pusio will run easily to the last couplet of the key, but the author is unable to separate that sex of these two species.

DESCRIPTION: MALE:- elongate, parallel-sided. HEAD: length almost three-fourths width, 0.37 (0.37-0.39): 0.50 (0.49-0.52); interocular width, 0.29 (0.29-0.30); clypeus slightly longer than juga; latter with four marginal pegs; surface, except clypeus, with coarse, crowded punctures; antennals, I, 0.11 (0.10-0.12): II, 0.02 (0.02-0.03): III, 0.19 (0.17-0.20): IV, 0.18 (0.16-0.20): V, 0.20 (0.19-0.22); labium reaching between middle coxae, segments, I, 0.16 (0.14-0.18): II, 0.21 (0.20-0.23): III, 0.26 (0.27-0.27): IV, 0.21 (0.20-0.23). PRONOTUM: length less than two-thirds width, 0.68 (0.64-0.71): 1.08 (1.05-1.13); anterior margin virtually truncate, not concave; lateral margin weakly sinuate on basal third; transverse impression moderate, punctate; anterior lobe weakly tumid, with prominent punctures laterally, subapically, along midline and scattered over disc of calli; posterior lobe, except umbones, with close-set, moderate punctures. SCUTELLUM: length: width:: 0.44 (0.43-0.46): 0.51 (0.49-0.54). HEMELYTRON: mesocorium with few discal punctures; exocorium abundantly punctate across full width. PROPLEURON: prosternal carinae lower than labial II, subrectangular. LEGS: anterior femur ventrally near basal third with strongly oblique, stout spine slightly emarginate at apex; anterior tibia ventrally with strong, subbasal spine in addition to median angulation (Fig. 132); posterior femur with subapical oblique spine simple, about half as high as femur. TERMINALIA: gonostylus as illustrated (Fig. 285). LENGTH of body, 1.94 (1.93-1.96).

COLOR: light brownish-yellow, coria, legs and labium slightly but distinctly paler.

TYPE DATA: HOLOTYPE male in the collection of the United States National Museum, labelled "Hamilton Co., Tenn., 8-13-40, W. F. Turner, At Light." PARATYPES: UNITED STATES: Arkansas: Hope, Ark., 1m (USNM). Howard Co., Ark., 9-24-37, 1m (USNM). District of Columbia: Washington D. C. VIII-6-40, W. E. Hoffman, at light, 1m (USNM). Florida: Coronado Beach, Fla., II-26-39, C. A. Frost Coll., 1m (USNM). Georgia: Atlanta, Ga., 8-24-44, P. W. Fattig, 1m (USNM). Demorest, Ga., IX-9, 1939, J. M. Valentine, 1m (USNM). Peach Co., Ga., V-18-43, light trap, 43-4930, Turner 20153, 1m, (USNM). Mississippi: Lincoln Co., Miss., IX-7-37, Turner & Anderson 6936, from soil, 1m (USNM). Missouri: Charleston, Mo., iv-18-17, Satterthwaite, Lantern, 2m (USNM). Scott Co., Mo., XI-9-37, W. F. Turner, 8011, 1m (USNM). South Carolina: Salvda Co., S. C. XII-3-37, W. F. Turner, 8613, 1m (USNM). Tennessee: Hamilton Co., Tenn., 8-21-42, t PP 282, at light, Lot No. 42-12638, 1m (USNM). Texas: Tyler, Tx., 2-23-38, Christianson, 6318, 1m (USNM). CUBA: Cayamas, Cuba, 16-3, E. A. Schwarz, 1m (USNM).

DISTRIBUTION: The general range indicated by the above records is for the southeastern United States from Washington, D. C. south to Florida, thence west to Missouri and Texas, with one series of specimens available from Cuba.

DISCUSSION: This species apparently has been masquerading under the name of pusio and pusillus, thus making published records of these two names even less reliable than they would have been in the former state of confusion that has plagued the Cydnidae for years.

Amnestus bolivari (Signoret)

1880 Pachymeroides bolivari Signoret, Bull. Soc. Ent. France, (6) 1:vii.

1883 Pachymeroides bolivari Signoret, Ann. Soc. Ent. France, (6) 3:366, pl. 10, fig. 191.

1893 Pachymeroides bolivari Lethierry and Severin, Gen. Catal. Hemip., 1:75.

DIAGNOSIS: The combination of the four marginal pegs on the jugum coupled with the closely punctate umbones will permit ready recognition of this species.

DESCRIPTION: MALE:- oval, widest across anterior pronotal lobe. HEAD: length more than four-fifths width, 0.50 (0.49-0.53): 0.59 (0.56-0.62); interocular width, 0.32 (0.30-0.34); clypeus distinctly surpassing juga, outline of head notched at their juncture; juga with four marginal spines; surface coarsely punctate between and posterior to eyes; antennals, I, 0.12 (0.11-0.13): II, 0.03 (0.03-0.05): III, 0.25 (0.24-0.26): IV and V missing on all specimens; labium attaining middle coxae, segments, I, 0.21 (0.20-0.23): II, 0.28 (0.26-0.31): III, 0.28 (0.26-0.31): IV, 0.23 (0.20-0.26). PRONOTUM: length more than two-thirds width, 0.98 (0.63-1.06): 1.41 (1.35-1.50); anterior margin moderately concave, deeply cupped behind eyes; lateral margin slightly concave and weakly converging on basal half; transverse impression moderately impressed, punctate; anterior lobe, including most of claval disc, with crowded, prominent punctures; posterior lobe, including umbones, densely punctate. SCUTELLUM: length: width:: 0.52 (0.50-0.54): 0.66 (0.63-0.72). HEMELYTRON: mesocorium with few scattered punctures discally; exocorium abundantly punctate across full width. PROPLEURON: prosternal carinae about twice as high as labial II, anterior margin vertical, ventral margin concave. LEGS: anterior femur with medio-ventral spine strongly oblique, unequally furcate, with small, subapical tubercle on postero-ventral margin; anterior tibia without median angulation

ventrally; posterior femur with ventral, subapical spine very short, oblique, not or weakly bifid. TERMINALIA: gonostylus as illustrated (Fig. 286). LENGTH of body, 2.27 (2.15-2.38).

FEMALE:- similar to male, lacking secondary sexual modifications and widest across humeri. HEAD: length: width:: 0.48 (0.46-0.52): 0.58 (0.53-0.61); interocular width, 0.30 (0.30-0.32); antennals, I, 0.11 (0.10-0.12): II, 0.03 (0.02-0.03): III, 0.24 (0.20-0.29): IV, 0.22 (0.18-0.27): V, 0.23 (0.21-0.26); labials, I, 0.22 (0.21-0.24): II, 0.26 (0.22-0.30): III, 0.26 (0.26-0.29): IV, 0.22 (0.20-0.24). PRONOTUM: length: width:: 0.81 (0.70-0.91): 1.36 (1.20-1.52). SCUTELLUM: length: width:: 0.51 (0.46-0.56): 0.62 (0.53-0.71). LENGTH of body, 2.12 (1.89-2.30).

TYPE DATA: Signoret's type was listed from "Coca (Equateur)." This specimen was not located.

DISTRIBUTION: The small series of specimens studied was from Panama and Ecuador.

DISCUSSION: Although the type of bolivari has not yet been positively located, there is in the Signoret collection at the Naturhistorisches Museum in Vienna, Austria, a card point with two legs of a male glued to it. The labels on it show that the specimen was from "Ecuador" and had been determined by Signoret as Pachymeroides bolivari. Although no type label is present, this specimen may well by the type. But as is frequently the case with Signoret's works, his specimens do not agree with the illustrations in his "Revision." The remaining front leg does not show the two ventral tubercles between the middle and subapical spines. But two features shown by Signoret (1883: fig. 191), the four marginal jugal pegs and the closely punctate umbones, allows no choice except to assign his name to the

present form.

Examination of the available specimens showed the antennae to be five-segmented, not four-segmented as described (the second being minute and weak); and that both evaporatoria occupy the full extent of their respective pleurae. Thus, the two main features separating Pachymeroides and Amnestus disappear, and the former, with bolivari as type, must fall as a synonym of the latter.

SPECIMENS STUDIED: 8 males, 6 females. PANAMA: Barro Colorado Is., C. Z., Jan.-Mar.-44, Zetek-5122, 2m, 1f (USNM). Same locality, VII-VIII-42, Jas. Zetek, No. 4985, 4m, 3f (RCF, USNM). Same locality, X-XI-1941, Jas. Zetek, No. 4915, 1m, 2f (USNM). ECUADOR: "Ecuador," 2 legs only, 1m (Vienna).

Amnestus brunneus Signoret

1883 Amnestus brunneus Signoret, Ann. Soc. Ent. France, 1883:370, pl. 10, fig. 194.

1886 Amnestus brunneus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Amnestus brunneus Lethierry and Severin, Gen. Catal. Hemip., 1:75.

DIAGNOSIS: Among the species with five marginal pegs on each jugum and the low, rounded prosternal carinae which are not higher than labial II, brunneus may be characterized by the short clypeus which only very slightly surpasses apices of juga and by the strongly contrasting yellowish (in large part) coria with the dark brown or brownish-black pronotum and scutellum.

DESCRIPTION: (based on one male and one female compared with the type) MALE:- elongate-oval, slightly widest behind middle. HEAD: length more than three-fourths width, 0.40: 0.52; interocular width, 0.32; anterior outline elongate, clypeus very slightly surpassing apices of juga; surface shining,

strongly punctate on bases of juga and on interocular area; jugum with five marginal pegs; antennals, I, 0.11: II, 0.03: III, 0.23: IV and V missing; labium reaching between middle coxae, segments, I, 0.16: II, 0.22: III, 0.29: IV, 0.20. PRONOTUM: length two-thirds of width, 0.81: 1.21; anterior margin shallowly emarginate; lateral margin very shallowly emarginate subbasally; transverse impression moderately indicated, marked by row of coarser punctures; anterior lobe weakly tumid, with two more or less complete rows of coarse punctures subapically and laterally, calli shining with few scattered, minute punctures, midline with double row of fine punctures; posterior lobe, except umbones which project to anterior lobe as a ridge, with numerous separated punctures becoming finer posteriorly. SCUTELLUM: wider than long, 0.60: 0.50. HEMELYTRON: with few punctures near apex; exocorium closely and uniformly punctured over entire area. PROPLEURON: prosternal carinae not higher than labial II, broadly rounded in profile. LEGS: anterior femur with premedian, oblique, stout spine unequally furcate; anterior tibia vaguely, obtusely angled ventrally near midlength; posterior femur ventrally with slender, oblique, subapical spine about half as long as femoral height, dorsally with distinct, subapical angulation. TERMINALIA: gonostylus as illustrated (Fig. 287). LENGTH of body, 2.08.

FEMALE:- similar to male, but without secondary sexual modifications. HEAD: length: width:: 0.40: 0.50; interocular width, 0.32; antennals, I, 0.13: II, 0.04: III, 0.22: IV and V missing; labials, I, 0.16: II, 0.23: III, 0.29: IV, 0.20. PRONOTUM: length: width:: 0.84: 1.22. SCUTELLUM: length: width:: 0.44: 0.56. LENGTH of body, 2.10.

COLOR: Head, pronotum and scutellum dark brown, contrasting strongly with yellowish-hyaline clavus and corium, latter with broad apical margin

weakly to distinctly fuscous; underside brownish, legs tannish-brown with apices of femora and tarsi yellow.

TYPE DATA: None of the three specimens from the Signoret collection in the Naturhistorisches Museum in Vienna bears a type designation; but all are from Mexico and all bear labels indicating that Signoret had determined them as this species. Thus, these may be accepted as the type series because Signoret (loc. cit.) listed the original locality simply as "Mexique."

DISTRIBUTION: All specimens examined had come from Mexico.

DISCUSSION: As is unfortunately true for many of Signoret's studies in the Cydnidae, there are certain discrepancies between his specimens and his published work. Several of these disagreements in the case of the present species may be pointed out here: clypeus actually slightly surpasses juga; anterior pronotal lobe has median punctures concentrated in a broad, median line, not in two rows; there are no setigerous punctures across calli; pronotal transverse impression more nearly median than shown; metapleuron not showing the complicated "fold" pattern depicted anterior and lateral to the peritreme; and mesocorium has several obsolete but noticeable punctures apically.

SPECIMENS STUDIED: The three specimens from the Signoret collection in the Naturhistorisches Museum in Vienna are all labelled "Coll. Signoret" and "brunneus det. Signoret." Two of them bear no further labelling except the word "Mexico," while the third one presents the data, "Bilimek, Mexico, 1871, Coricavacca." The other specimens studied had the following information: "Del Mais, S. L. P., Mex., VI-17-47, on orchids, Intercepted at Laredo, Texas, 47-9428," 1f (USNM); "Oaxaca, Mex., May 13, 1938, R. Greenfield," 1m (USNM).

Amnestus championi Distant

1880 Amnestus championi Distant, Biol. Centr.-Amer., Rhynch., 1:453.

DIAGNOSIS: Among the species with five marginal jugal pegs, this one is most easily identified by the impunctate outer half of the exocorium.

DESCRIPTION: MALE:- oval, widest behind middle. HEAD: length more than three-fourths width, 0.43 (0.39-0.46): 0.55 (0.51-0.58); interocular width, 0.37 (0.30-0.33); jugum with five marginal pegs increasing in length apically; surface with broad shallow punctures between eyes; antennals, I, 0.12 (0.11-0.16): II, 0.03 (0.03-0.04): III, 0.25 (0.23-0.30): IV, 0.24 (0.22-0.26): V, 0.26 (0.23-0.29); labium reaching between middle coxae, segments, I, 0.20 (0.16-0.23): II, 0.29 (0.26-0.31): III, 0.25 (0.23-0.27): IV, 0.20 (0.20-0.22). PRONOTUM: length almost three-fourths width, 0.96 (0.75-1.13): 1.35 (1.20-1.52); anterior margin shallowly concave; lateral margin weakly concave on basal half; transverse impression obtusely impressed, marked by row of close-set, elongate, coarse punctures; anterior lobe moderately tumid, with two or three irregular rows of coarse punctures laterally and subapically, minutely punctate along midline and on center of calli; posterior lobe with scattered punctures becoming finer posteriorly, umbones impunctate. SCUTELLUM: length three-fourths width, 0.49 (0.45-0.56): 0.65 (0.60-0.73). HEMELYTRON: mesocorium with few punctures apically; exocorium impunctate on outer half. PROPLEURON: prosternal carinae higher than labial II, ventral margin concave (Fig. 40). LEGS: anterior femur with unequally bifid spine ventrally on basal third, with short, subapical tubercle on postero-ventral margin; anterior tibia obtusely angled ventrally near middle; posterior femur angled dorsally near apex, ventrally with weakly curved, stout spine (about two-thirds of femoral height) at apical

fourth. TERMINALIA: gonostylus as illustrated (Fig. 288). LENGTH of body, 2.26 (1.87-2.60).

FEMALE:- similar to male but lacking secondary sexual modifications. HEAD: length; width:: 0.42 (0.38-0.46): 0.55 (0.52-0.62); interocular width, 0.31 (0.30-0.34); antennals, I, 0.13 (0.12-0.15): II, 0.03 (0.03-0.04): III, 0.27 (0.23-0.38): IV, 0.22 (0.20-0.28): V, 0.26 (0.23-0.32); labials, I, 0.18 (0.16-0.23): II, 0.28 (0.26-0.30): III, 0.25 (0.23-0.28): IV, 0.20 (0.20-0.21). PRONOTUM: length: width:: 0.82 (0.73-0.90): 1.31 (1.17-1.46): SCUTELLUM: length: width:: 0.49 (0.46-0.53): 0.65 (0.58-0.76). LENGTH of body, 2.18 (1.98-2.42).

COLOR: Head, pronotum and scutellum dark, reddish-brown; coria and clavus yellowed, with spot near basal fourth and apical margin of corium and apical cloud on clavus light to dark fuscous; venter, in fully colored specimens, as dark as pronotum; legs and labium yellowed.

TYPE DATA: Distant's (loc. cit.) single specimen was from "Guatemala, Zapote." This type is probably in the British Museum of Natural History.

DISTRIBUTION: The entire series of sixteen specimens that was studied was from the island of Cuba, which is not very greatly distant from Guatemala.

DISCUSSION: This is the only species seen which agrees with Distant's color description.

SPECIMENS STUDIED: 6 males, 10 females. CUBA: Soledad, Sta. Clara, Aug. 1932, B. B. Leavitt, 6m, 9f (RCF, MCZ). San Vincente, Pinar del Rio, 26 July - 5 Aug., 1939, C. T. Parsons, 1f (MCZ).

Amnestus cribratus (Stal)

1860 Magoa cribratus Stal, Svenska Vet.-Ak. Handl., 2(7):14.

1867 Amnestus cribratus Walker, Catal. Hemip. Brit. Mus., 1:170.

1876 Amnestus cribratus Stal, Svenska Vet.-Ak. Handl., 14(4):21.

1883 Amnestus cribratus Signoret, Ann. Soc. Ent. France, (6) 3:370, pl. 10, fig. 195.

1893 Amnestus cribratus Lethierry and Severin, Gen. Catal. Hemip., 1:75.

DIAGNOSIS: The punctate umbones coupled with the color pattern (coria mostly yellowish-hyaline, contrasting strongly with dark brown head, pronotum and scutellum) will mark this species from its congenors.

DESCRIPTION: (from two males and two females). MALE:- oval, sides parallel. HEAD: length about four-fifths width, 0.49 (0.48-0.50): 0.61 (0.58-0.64); interocular width, 0.34 (0.33-0.36); clypeus surpassing truncated juga by less than own width, with four apical pegs; juga with five marginal pegs; surface cribrately punctate except on clypeus and base; antennals, I, 0.13 (0.13-0.13): II, 0.03 (0.03-0.04): III, 0.26 (0.26-0.26): IV, 0.23 (0.23-0.23); V, 0.26 (0.26-0.26); labium reaching between middle coxae, segments, I, 0.26: II, 0.30 (0.30-0.30): III, 0.31 (0.31-0.32): IV, 0.23 (0.22-0.24). PRONOTUM: length almost two-thirds width, 0.96 (0.92-1.00): 1.54 (1.45-1.63); anterior margin moderately concave, cupped behind eyes; transverse impression distinct, marked by row of coarse punctures; anterior lobe moderately tumid, strongly and closely punctate laterally, apically, medially, posteriorly and on most of calli; posterior lobe, including umbones, with crowded, strong punctures. SCUTELLUM: length more than three-fourths width, 0.58 (0.56-0.61): 0.75 (0.70-0.80). HEMELYTRON: mesocorium hyaline with few punctures near apex; exocorium uniformly and

closely punctate across entire width. PROPLEURON: prosternal carinae anteriorly higher than labial II, bluntly triangular with apex ventrally. LEGS: anterior tibia with oblique, premedian, stout spine unequally furcate, with small, subapical spine on posterior margin; anterior tibia without median angulation ventrally; posterior femur with strong, subapical angulation dorsally, and ventrally with strong bifid, subapical tooth. TERMINALIA: gonostylus as illustrated (Fig. 289). LENGTH of body, 2.52 (2.42-2.63).

FEMALE:- similar to male, but without the secondary sexual modifications. HEAD: length: width:: 0.49 (0.47-0.51): 0.63 (0.63-0.63); interocular width, 0.34 (0.34-0.35); antennals, I, 0.13 (0.13-0.13): II, 0.03 (0.03-0.03): III, 0.25 (0.24-0.26): IV, 0.23 (0.23-0.23): V, 0.25 (0.25-0.26); labials, I, 0.24 (0.23-0.25): II, 0.28 (0.28-0.28): III, 0.32 (0.31-0.33): IV, 0.23 (0.23-0.23). PRONOTUM: length: width:: 0.94 (0.88-1.00): 1.58 (1.53-1.64). SCUTELLUM: length: width:: 0.63 (0.60-0.66): 0.78 (0.70-0.86). LENGTH of body, 2.52 (2.44-2.60).

COLOR: Head, pronotum, scutellum and vague band across basal fourth of corium blackish-brown, corium mostly translucent yellow; venter reddish-brown, legs paler.

TYPE DATA: Stal (loc. cit.) described his species from a female, now in the Riksmuseum in Stockholm, Sweden, from "Rio Janeiro." This specimen was kindly made available for study by Dr. Rene Malaise of that institution.

DISTRIBUTION: The small series of specimens studied, like the type, came from southern Brazil.

DISCUSSION: Under the genotype heading in the present treatment of Amnestus the author designated this species as genotype of Stal's synonymous Magoa.

SPECIMENS STUDIED: 3 males, 3 females. BRAZIL: Brasil, F. Sahlb., Typus, 1f (Stock) Nova Teutonia, Santa Catarina, I-4, 1953, V-8, 1952, IX-22, 29, 1952, F. Plaumann, 3m, 2f (JCL).

Amnestus diminuatus Barber

1939 Amnestus diminuatus Barber, Sci. Surv. Porto Rico and the Virgin Islands, 14, part 3, p. 274, fig. 1.

DIAGNOSIS: Among the species with four marginal pegs on the jugum this one may be recognized by its extremely small size (length of body, 1.60) and the very short labium which does not attain middle coxae.

DESCRIPTION: (based on the male paratype, the only specimen available for study) MALE:- elongate-oval, sides subparallel. HEAD: length about three-fourths width, 0.34: 0.43; interocular width, 0.24; clypeus very slightly surpassing apices of juga but continuing outline; surface with coarse, close punctures, except on transversely rugulose clypeus; jugum with four marginal pegs; antennals, I, 0.08: II, 0.02: III, 0.15: IV, 0.13: V, 0.16; bucculae almost half as long as labial I, not as high as labial II; labium reaching middle of mesosternum, segments, I, 0.12: II, 0.14: III, 0.20: IV, 0.13. PRONOTUM: length two-thirds of width, 0.63: 0.90; anterior margin very feebly doubly emarginate, cupped behind eyes; lateral margin feebly sinuate at basal third; transverse impression obtuse, feebly impressed, its included row of punctures not enlarged; anterior lobe subapically and laterally with two irregular rows of coarser punctures, midline and large patch on calli with numerous smaller punctures; posterior lobe, except umbones, with numerous distinct punctures becoming finer posteriorly. SCUTELLUM: wider than long, 0.53: 0.36. HEMELYTRON: mesocorium impunctate discally except at extreme outer, apical angle; exocorium

uniformly and closely punctured over entire area. PROPLEURON: prosternal carinae lobulate, about as high as labial II, slightly more steeply terminated posteriorly. LEGS: anterior femur ventrally with oblique, stout, blunt, premedian spine; anterior tibia neither angled nor spined ventrally near middle; posterior femur ventrally with oblique, simple, subapical spine, dorsally with subapical angulation; posterior tibia more or less compressed, straight. LENGTH of body, 1.60.

TYPE DATA: Barber (loc. cit.) gave the type locality of his male type as "Adjuntas, Porto Rico." This specimen is now in the collection of the United States National Museum.

DISTRIBUTION: At this time, diminuatus is known only from its type locality.

DISCUSSION: The present concept of this species is based on the male paratype which was kindly made available for study by Dr. R. I. Sailer of the United States National Museum. The specimen agreed well with the original description and figure, differing only in the spelling of the trivial name on the determination label, there it is spelled without the "a", obviously a lapsus.

SPECIMENS STUDIED: 1 male. PUERTO RICO: Adjuntas, P. R., Apr. 21, 1933, Faxon, Anderson, Mills, Oakley, in net above woods, U. S. N. M. Paratype 51580, 1m (USNM).

Amnestus explanatus NEW SPECIES

DIAGNOSIS: Among the species with four marginal pegs on each jugum, this one may be recognized by the narrowly but distinctly explanate costal margins plus the anterior margin of the pronotum being distinctly wider than the head (Fig. 64).

DESCRIPTION: (based on one male) MALE:- elongate, subparallel. HEAD: length more than three-fourths width, 0.44: 0.56; interocular width, 0.27; clypeus distinctly surpassing apices of juga; latter with four, small, marginal pegs; surface, except clypeus, with coarse, close punctures; antennals, I, 0.10: II, 0.02: III, 0.26 : IV and V missing; labium reaching mesosternum, segments, I, 0.19: II, 0.23: III, 0.25: IV, 0.22. PRONOTUM: length more than half width, 0.73: 1.24; anterior margin wider than head, broadly, moderately concave, lateral angle cupped behind eye; lateral margin straight and subparallel on basal half; transverse impression obtuse, punctate; anterior lobe moderately tumid, coarsely punctate laterally, subapically, along midline and over most of disc of calli; posterior lobe with crowded, coarse punctures, except on dorso-lateral face of umbones. SCUTELLUM: length: width:: 0.50: 0.60. HEMELYTRON: mesocorium discally virtually impunctate; exocorium closely and coarsely punctate for full width; costal margin narrowly but distinctly explanate and recurved, width of explanation nearly equal to diameter of hind tibia. PROPLEURON: prosternal carinae higher than labial II, ventral margin distinctly concave. LEGS: anterior femur ventrally with straight, simple, oblique spine near basal third; anterior tibia ventrally with very weak, obtuse angulation medially; posterior femur ventrally with subapical spine very short, oblique, simple, acute. TERMINALIA: gonostylus as illustrated (Fig. 290). LENGTH of body, 2.21.

COLOR: Yellowish-brown, coria, legs and labium somewhat paler.

TYPE DATA: The species is here described from a single male, the HOLOTYPE, in the collection of the United States National Museum, labelled, "Horqueta, Paraguay, 45 miles E, Paraguay Riv., I-27, 1934, Alberto Schulze."

DISTRIBUTION: The type specimen from Paraguay is the only specimen known.

DISCUSSION: The unusual condition of the explanate costal margin suggested the specific name proposed here.

Amnestus forreri Distant

1880 Amnestus forreri Distant, Biol. Centr.-Amer., Rhynch., 1:307.

DIAGNOSIS: The present species and cribratus (Stal) differ from all other species of Amnestus with five marginal pegs on jugum in having numerous distinct punctures on the pronotal umbones and having most of the disc of the calli coarsely and closely punctate similar to the lateral parts of the anterior pronotal lobe; they may be separated from each other by the shape of the prosternal carinae--cribratus has these structures concave ventrally with a strongly triangular lobe anteriorly, while forreri has the ventral margin of these carinae virtually straight.

DESCRIPTION: (based on two males) MALE:- elongate-oval, sides almost parallel. HEAD: length slightly shorter than width, 0.60 (0.60-0.60): 0.66 (0.66-0.67); interocular width, 0.38 (0.37-0.40); clypeus surpassing juga by distance equalling one-half its own width; surface coarsely and closely punctate except on clypeus and apical halves of juga; jugum with five marginal pegs, anterior one or two abruptly longer than others; antennals, I, 0.13 (0.13-0.14): II, 0.03 (0.03-0.04): III, 0.30 (0.30-0.30): IV, 0.26 (0.26-??): V, 0.30 (0.30-??); labium reaching almost to bases of middle coxae, segments, I, 0.24 (0.23-0.26): II, 0.38 (0.36-0.41): III, 0.25 (0.24-0.26): IV, 0.23 (0.23-0.24). PRONOTUM: length three-fourths of width, 1.23 (1.23-1.23): 1.61 (1.61-1.62); anterior margin very feebly

concave, cupped behind eyes; lateral margin sinuate near base; transverse impression weak except laterally, marked by row of coarse punctures; anterior lobe with broad band of coarse punctures laterally and subapically, and with numerous, close-set moderate punctures along midline and over most of calli; posterior lobe, including umbones, with very numerous, close-set punctures becoming finer posteriorly. SCUTELLUM: wider than long, 0.85 (0.84-0.85): 0.67 (0.66-0.68). HEMELYTRON: mesocorium impunctate except for two rows paralleling claval suture; exocorium distinctly and strongly punctate virtually to costa. PROPLEURON: prosternal carinae higher than labial II, anterior margin roundingly perpendicular, ventral margin straight and almost horizontal, posterior end lower but abruptly terminated. LEGS: anterior femur ventrally with premedian oblique spine very unevenly furcate; and with subapical small tubercle on postero-ventral margin; anterior tibia ventrally neither angled nor spined at middle; posterior femur ventrally with subapical stout spine oblique, shorter than height of femur, subequally furcate at apex, dorsally with subapical angulation. TERMINALIA: gonostylus as illustrated (Fig. 291). LENGTH of body, 2.89 (2.82-2.96).

COLOR: Most of head, anterior lobe of pronotum, scutellum and most of underside yellowish-brown; posterior lobe of pronotum, clavi, coria and appendages yellowish.

TYPE DATA: The type, now in the British Museum of Natural History, was listed by Distant (loc. cit.) as coming from "Mexico, Ventanas in Durango (Forrer): Panama, Volcan di Chiriqui 4000 to 6000 feet (Champion)."

DISTRIBUTION: The two males studied had both come from Panama.

DISCUSSION: The specimens assigned here closely fit Distant's original description except that the antennae are pale and not "pitchy" as described

there.

SPECIMENS STUDIED: 2 males. PANAMA: Barro Colo. I., C. Z., X-XI, 1941, Jas. Zetek, No. 4915, 1m (USNM). Cano Saddle, Gatun Lake, V-3-23, R. C. Shannon, 1m (USNM).

Amnestus foveatus NEW SPECIES

DIAGNOSIS: The greatly enlarged prosternal carinae with the large blackened fovea will separate foveatus from the other species of the genus.

DESCRIPTION: MALE:- elongate-oval, widest behind middle. HEAD: length more than two-thirds width, 0.47 (0.42-0.53): 0.61 (0.56-0.67); interocular width, 0.35 (0.33-0.38); clypeus slightly surpassing apices of juga; surface shining, anteocular part impunctate, remainder with numerous crowded punctures; jugum with five small marginal pegs becoming shorter and finer toward eyes; antennals, I, 0.13 (0.13-0.15): II, 0.04 (0.03-0.05): III, 0.23 (0.23-0.26): IV, 0.22 (0.20-0.26): V, 0.23 (0.23-0.25); bucculae reduced, about one-third as long as labial I and subequal to it in height; labium reaching apices of hind coxae, segments, I, 0.21 (0.19-0.26): II, 0.25 (0.23-0.26): III, 0.25 (0.23-0.27): IV, 0.23 (0.23-0.25). PRONOTUM: length two-thirds of width, 0.90 (0.78-1.02): 1.45 (1.36-1.61); anterior margin doubly emarginate, cupped behind eyes; lateral margin with broad, shallow, rounded emargination near base; transverse impression distinct, marked by row of coarse punctures; anterior lobe feebly or not tumid, with broad band of coarse punctures subapically and laterally, calli and intercallar area with numerous moderate, distinct, punctures; posterior lobe, except umbones, with numerous separated punctures becoming obsolete

posteriorly. SCUTELLUM: wider than long, 0.62 (0.58-0.70): 0.57 (0.54-0.64); disc polished, with numerous coarse punctures. HEMELYTRON: mesocorium discally with scattered small punctures; exocorium uniformly punctured throughout. PROPLEURON: prosternal carinae subquadrate, more than twice as high as labial II, with large fuscous to black fovea basally on posterior half (Fig. 39). LEGS: anterior femur with stout, submedian ventral spine with shallow emargination in apical truncation; anterior tibia with ventral margin neither angled nor spined; posterior tibia ventrally with subapical angulation on spine, and dorsally with subapical angulation. TERMINALIA: gonostylus as illustrated (Fig. 293). LENGTH of body, 2.41 (2.21-2.66).

FEMALE:- similar to male, but anterior and posterior femora without armature described for that sex. HEAD: length: width:: 0.48 (0.44-0.51): 0.60 (0.57-0.63); interocular width, 0.35 (0.34-0.40); antennals, I, 0.13 (0.13-0.15): II, 0.03 (0.03-0.04): III, 0.22 (0.22-0.23): IV, 0.20 (0.19-0.22): V, 0.23 (0.23-0.24); labials, I, 0.22 (0.21-0.23): II, 0.25 (0.23-0.27): III, 0.25 (0.23-0.27): IV, 0.21 (0.20-0.23). PRONOTUM: length: width:: 0.79 (0.72-0.86): 1.40 (1.33-1.51). SCUTELLUM: length: width:: 0.56 (0.53-0.61): 0.62 (0.60-0.66). LENGTH of body, 2.28 (2.15-2.47).

TYPE DATA: HOLOTYPE male and ALLOTYPE female, "Nova Teutonia, Sta. Catarina, Brazil, X-11, 1952, F. Plaumann," both in collection of John C. Lutz, Philadelphia, Pennsylvania. PARATYPES: from same locality, year and collector, various dates: 5m, VIII-8, IX-24 and X-11; 8f, VIII-8 & 18, X-5, 9, 11, 14 & 23 (all in collection JCL).

DISTRIBUTION: At present A. foveatus is known only from the type series from southern Brazil.

DISCUSSION: The prominent, blackened fovea near the base of the buccula suggested the present specific name.

Amnestus lautipennis (Stal)

1860 Magoa lautipennis Stal, Svenska Vet.-Ak. Handl., 2(7):14.

1867 Magoa lautipennis Walker, Catal. Hemip. Brit. Mus., 1:170.

1876 Amnestus lautipennis Stal, Svenska Vet.-Ak. Handl., 14(4):21.

1883 Amnestus lateralis Signoret, Ann. Soc. Ent. France, (6) 3:369, pl. 10, fig. 193.

1883 Amnestus lautipennis Signoret, Ann. Soc. Ent. France, (6) 3:371, pl. 10, fig. 196.

1893 Amnestus lateralis Lethierry and Severin, Gen. Catal. Hemip., 1:75.

1893 Amnestus lautipennis Lethierry and Severin, Gen. Catal. Hemip., 1:75.

DIAGNOSIS: The low, rounded prosternal carinae coupled with the unmarked, yellow coria which are distinctly paler than the dark brown pronotum and scutellum will mark this from other small species (less than 2.5) with five marginal, jugal pegs.

DESCRIPTION: (based on two males) MALE:- oval, widest behind middle. HEAD: length about four-fifths width, 0.42 (0.41-0.44): 0.52 (0.52-0.53); interocular width, 0.31 (0.31-0.31); clypeus slightly longer than juga; latter with five marginal pegs; surface distinctly punctate on juga and between eyes; antennals, I, 0.12 (0.12-0.13): II, 0.03 (0.03-0.03): III, 0.17 (0.16-0.18): IV, 0.20 (0.20-0.20): V, 0.22 (0.21-0.23); labium reaching bases of middle coxae, segments, I, 0.17 (0.16-0.18): II, 0.23 (0.23-0.23): III, 0.26 (0.26-0.27): IV, 0.22 (0.21-0.23). PRONOTUM: length about two-thirds width, 0.79 (0.74-0.84): 1.20 (1.16-1.25); anterior

margin shallowly concave; lateral margins straight on basal half; transverse impression distinct, with row of coarse punctures; anterior lobe moderately tumid, with several rows of coarse punctures laterally and subapically, with few small punctures on midline and on disc of calli; posterior lobe with scattered punctures; umbones impunctate, not continued to anterior lobe as impunctate ridge. SCUTELLUM: length: width:: 0.44 (0.43-0.45): 0.53 (0.50-0.56). HEMELYTRON: mesocorium with few scattered punctures apically; exocorium punctate for full width. PROPLEURON: prosternal carinae lower than labial II, rounded. LEGS: anterior femur ventrally with oblique, stout, unequally furcate spine near basal third; anterior tibia not angled near middle of ventral margin; posterior femur ventrally with subapical spine compressed, obliquely truncated at apex, as long as two-thirds femoral height. TERMINALIA: gonostylus as illustrated, (Fig. 292). LENGTH of body, 2.08 (1.89-2.28).

COLOR: Head, pronotum and scutellum reddish-brown, coria yellow, unmarked; venter paler reddish-brown, legs and labium yellow.

TYPE DATA: Since no type locality was recorded by Stal (loc. cit.), one may assume from the title of his paper that it was "Rio Janeiro." The type specimen, however, which was generously loaned for study by Dr. Rene Malaise of the Naturhistoriska Riksmuseum in Stockholm, Sweden, bears the simple label, "Brasil." Signoret (loc. cit.) listed his type specimens from "Bresil," and "Buenos Ayres." Neither of these specimens has been located.

DISTRIBUTION: The type and one other specimen examined were both from Brazil.

DISCUSSION: The *Amnestus lateralis* of Signoret (loc. cit.) is here

synonymized with lautipennis because neither the original description nor the accompanying sketches showed any real differences between the two. In fact, Signoret's figure of lateralis is a better representation of Stal's type than is his illustration of lautipennis. The author is confident that this is another case of Signoret being misled by his own inaccurate drawings. If Berg's specimen can be located the matter may be settled conclusively, but from the data at hand, lateralis Signoret must fall as a synonym.

SPECIMENS STUDIED: 2 males. BRAZIL: Brasil, Typus, 1m (Stock). Brazil on cabbage, [intercepted at] N. Orleans, La., III-9-38, 1m (USNM).

Amnestus pallidus Zimmer

1910 Annectus [!] pallidus Zimmer, Canadian Ent., 42:166, fig. 10.

1917 Amnestus pallidus Van Duzee, Univ. California Pubs. Ent., 2:23.

1939 Amnestus pallidus Torre Bueno, Ent. Amer., 19:183.

DIAGNOSIS: The almost concolorous reddish-brown head, pronotum, scutellum and corium plus the shorter labium which does not reach posterior coxae will separate this species from all of those with five marginal pegs on the jugum.

DESCRIPTION: MALE:- oval, widest behind middle. HEAD: length more than three-fourths width, 0.44 (0.40-0.53): 0.57 (0.50-0.70); interocular width, 0.36 (0.31-0.44); clypeus as long as juga; latter with five sub-equal, marginal pegs; surface, except clypeus and apex of jugum, coarsely punctate; antennals, I, 0.12 (0.10-0.17): II, 0.03 (0.02-0.04): III, 0.28 (0.23-0.36): IV, 0.28 (0.23-0.33): V, 0.28 (0.23-0.36); labium attaining middle of metasternum, segments, I, 0.22 (0.20-0.26): II, 0.30 (0.27-0.39):

III, 0.39 (0.31-0.53): IV, 0.26 (0.23-0.31). PRONOTUM: length about two-thirds width, 0.90 (0.76-1.30): 1.44 (1.21-1.44); anterior margin shallowly concave, almost straight across; lateral margin straight on basal half; transverse impression obsolete, marked by vague row of punctures; anterior lobe with three or four irregular rows of moderate to coarse punctures laterally, subapically and along median band, calli mostly polished, with few fine punctures discally; posterior lobe, except umbones, with widely scattered punctures. SCUTELLUM: length: width:: 0.61 (0.50-0.81): 0.74 (0.63-0.90). HEMELYTRON: mesocorium with few scattered, obsolete punctures discally; exocorium abundantly punctate across full width. PROPLEURON: prosternal carinae lower than labial II, rounded. LEGS: anterior femur ventrally with premedian spine strong, oblique, unevenly bifid, and with blackish, subapical tubercle on postero-ventral margin; anterior tibia neither angled nor spined midventrally; posterior femur not angled dorsally near apex, ventrally with subapical spine short, less than half height of femur. TERMINALIA: gonostylus as illustrated (Fig. 294). LENGTH of body, 2.56 (2.08-3.26).

FEMALE:- similar to male, but without secondary sexual modifications. HEAD: length: width:: 0.48 (0.43-0.60): 0.60 (0.53-0.73); interocular width, 0.36 (0.31-0.46); antennals, I, 0.12 (0.10-0.16): II, 0.03 (0.02-0.04): III, 0.25 (0.20-0.33): IV, 0.24 (0.19-0.32): V, 0.25 (0.20-0.33); labials, I, 0.21 (0.20-0.23): II, 0.24 (0.23-0.36): III, 0.36 (0.31-0.46): IV, 0.24 (0.20-0.33). PRONOTUM: length: width:: 0.92 (0.80-1.16): 1.53 (1.31-1.92). SCUTELLUM: length: width:: 0.63 (0.51-0.90): 0.77 (0.63-0.99). LENGTH of body, 2.60 (2.28-3.20).

COLOR: Dorsally and ventrally, except for legs and labium, almost

unicolorous reddish-brown to piceous.

TYPE DATA: Zimmer (loc. cit.) listed his lone type as a female, but illustrated the typical leg armature of a male, from "South-east Nebraska." According to a letter from the late Dr. Myron Swenk to Dr. R. I. Sailer, the type specimen of this species was accidentally knocked from its pin and lost while it was being incorporated in the collection of the University of Nebraska.

DISTRIBUTION: The general range of this species extends across North America from Ontario to Washington and thence south to South Carolina, Texas and California.

DISCUSSION: In most collections examined, this species has been confused with spinifrons. The shorter labium, which here does not exceed the posterior coxae, will separate the two; or in the case of the males, the absence of a midventral angulation on the anterior tibia will mark it from spinifrons.

Zimmer's description of his specimen as a female was the result of confusion of the two sexes that was prevalent at that time.

Although several authors have reported this form from light, real ecological notes concerning it are quite few. Blatchley (1926) and Torre Bueno (1939) repeated Stoner's (1920) record of sweeping it from Antennaria plantaginifolia (L.) in Iowa. Parshley (1923:780) reported that it may be "occasionally found under stones and by sifting."

SPECIMENS EXAMINED: 59 males, 107 females. UNITED STATES: Arizona: Oak Crk. Canyon, Williams; July. California: Eldorado Co., Los Angeles Co., Madera Co.; September. Colorado: Colo. Georgia: Spalding Co.; March. Illinois: Algonquin, Aurora, Oakwood, Urbana, White Heath; April

to October. Indiana: Knox, Marion Co.; July. Iowa: Ames, Boone Co., Iowa City, Lake Okoboji, Louisa Co., Moran, Washington; April to October. Kansas: Ashland, Lawrence; June, July. Kentucky: McCraken Co.; September. Maryland: Cab. John; April. Massachusetts: Cambridge, Matick; June. Michigan: Washtenaw Co.; May. Nebraska: West Point; June. New Jersey: Bear Swamps, Hackettstn., Madison; May, July. New Mexico: Las Vegas, Mesilla Park, West Point; May, July. New York: Maspeth, Mosholu, West Hebron; May. North Carolina: Black Mts., Gray Beard Mt.; May, September. Ontario: Ridgeway; October. Oregon: Corvallis, McMinnville; October. Pennsylvania: Ingram, Philadelphia; May, June, September. Tennessee: Hamilton Co., October. Texas: Tex., Denison; November. Virginia: Augusta Co., Chain Bridge, Fairfax Co.; May, July, September. Washington: Payallup; March.

Amnestus pusillus Uhler

1876 Amnestus pusillus Uhler, Bull. United States Geol. Geog. Surv. Terr., 1:278.

1877 Amnestus pusillus Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:371.

1883 Amnestus pusillus Signoret, Ann. Soc. Ent. France, (6) 3:372, pl. 10, fig. 197.

1886 Amnestus pusillus Uhler, Checklist Hemip. N. Am., p. 3.

1893 Amnestus pusillus Lethierry and Severin, Gen. Catal. Hemip., 1:75.

1910 Amnestus pusillus Banks, Catal. Nearc. Hemip., p. 98.

1917 Amnestus pusillus Van Duzee, Univ. California Pubs. Ent., 2:23.

1939 Amnestus pusillus Torre Bueno, Ent. Amer., 19:183.

DIAGNOSIS: The male of pusillus may be easily recognized by the

presence on the hind femur of a ventral, subapical spine which is more than one-third as long as the tibia (Fig. 164). The female is also strongly marked by the presence of a flattened, polished, glabrous area on the middle of the last sternite (Fig. 184) and the presence of a short, oblique, subapical spine on the ventral margin of the posterior femur (Fig. 163), two features which appear to be unique with this species.

DESCRIPTION: MALE:- oval, widest behind midlength. HEAD: length three-fourths width, 0.42 (0.41-0.43): 0.56 (0.53-0.60); interocular width, 0.32 (0.31-0.34); clypeus slightly surpassing juga; latter with four marginal pegs becoming finer toward eye; surface, except clypeus, roughly punctate; antennals, I, 0.10 (0.07-0.13): II, 0.02 (0.02-0.03): III, 0.23 (0.21-0.25): IV, 0.23 (0.23-0.25): V, 0.23 (0.21-0.25); labium reaching bases of posterior coxae, segments, I, 0.18 (0.17-0.20): II, 0.26 (0.26-0.27): III, 0.28 (0.26-0.30): IV, 0.23 (0.20-0.26). PRONOTUM: length more than two-thirds width, 0.91 (0.84-1.03): 1.32 (1.24-1.50); anterior margin moderately concave; lateral margin faintly concave on basal third; transverse impression distinct, marked by regular row of coarser, closer punctures; anterior lobe with coarse punctures in three or four rows laterally and subapically, and along midline and scattered over calli; posterior lobe, except umbones, abundantly punctate. SCUTELLUM: length: width:: 0.59 (0.53-0.66): 0.65 (0.61-0.72). HEMELYTRON: mesocorium discally with single, irregular row of fine punctures; exocorium punctate for full width. PROPLEURON: prosternal carinae almost as high as labial II, abruptly terminated posteriorly. LEGS: anterior femur ventrally with submedian spine very short, simple; anterior tibia with two prominent angulations or spines on lower edge (as in Fig. 132); posterior femur ventrally with

subapical spine very long, more than third length of posterior tibia (Fig. 164). TERMINALIA: gonostylus as illustrated (Fig. 295). LENGTH of body, 2.30 (2.08-2.66).

FEMALE:- similar to male, but lacking secondary sexual modifications; posterior femur with small, oblique spine ventrally near apex (Fig. 163). HEAD: length: width:: 0.43 (0.43-0.44): 0.54 (0.53-0.55); interocular width, 0.33 (0.33-0.33); antennals, I, 0.10 (0.09-0.12): II, 0.02 (0.02-0.02): III, 0.21 (0.20-0.23): IV, 0.21 (0.20-0.23): V, 0.22 (0.21-0.24); labials, I, 0.16 (0.16-0.17): II, 0.25 (0.23-0.28): III, 0.33 (0.33-0.33): IV, 0.25 (0.25-0.27). PRONOTUM: length: width:: 0.73 (0.70-0.74): 1.24 (1.23-1.26). SCUTELLUM: length: width:: 0.51 (0.50-0.53): 0.56 (0.56-0.57). LENGTH of body, 2.19 (2.15-2.28).

COLOR: Yellowish-tan, coria, legs and labium usually slightly paler.

TYPE DATA: In the original description, Uhler (loc. cit.) reported that this species "Inhabits Indian Territory, Texas, Cuba, and generally the Eastern United States south of Cape Cod." His types are now in the collection of the United States National Museum.

DISTRIBUTION: Pusillus occupies a broad range in North America from Maine and Ontario west to Oregon, thence south to Virginia, Louisiana and Mexico. Two of the specimens examined were labelled as coming from Guatemala. These had been taken during plant inspection at port of entry stations in California and Texas. Both of these states are within the continuous range of the species, so perhaps the insects entered the shipment after its arrival.

DISCUSSION: The examination of a great number of specimens of this common species gave a rather comprehensive picture of the range of pusillus.

An interesting point that results is that pusillus is not a member of the West Indian fauna as reported by several early workers and refuted by later authors, including Barber (1939).

Uhler's (1894:227) habit note that "This small insect lurks beneath rubbish in sandy places, where it matches the color of the ground and is thus easily overlooked," summarizes all of the available ecological information on this form except the frequency and abundance with which it comes to light.

SPECIMENS STUDIED: 103 males, 154 females. CANADA: Ontario: Ridgeway; October. UNITED STATES: Arizona: Globe, San Carlos, Thatcher; July, August. Arkansas: Hope; October. California: Folsom. Colorado: Colo. Illinois: Grand Tower, Pittsfield, Urbana; July, August. Iowa: Ames, 4 mi. E of Gilbert; May to July. Kansas: Caldwell, Riley Co., Wellington; June, July. Kentucky: Henderson Co., September. Louisiana: Harahan, Shreveport, Tallulah; July to September. Maine: Paris; October. Maryland: Plummer's Island, Sparrow Point; June to August. Massachusetts: Chicopee; August. Missouri: Charleston, Columbia, Kinsey, Langdon, St. Joseph, St. Louis, Webster Groves; April to September. Nebraska: Falls City, Minden; August. New York: Queen Co.; June. Oregon: Forest Grove; June. Pennsylvania: Crisp. Phila. Neck. Pittsburg; August. Tennessee: Chattanooga, Clarksville, Hamilton Co., Nashville; July, August, November. Texas: Dallas, Devil's River, Kerrville, Victoria; June, July. Virginia: Falls Church, Nelson Co.; July, September. West Virginia: Cheat Mts.; June. MEXICO: Nuevo Leon: Monterey; August. GUATEMALA: Guatemala (two specimens so labelled were "intercepted" during plant inspections in California and Texas; perhaps these represent specimens that has entered shipments after their arrival).

Amnestus pusio (Stal)

1860 Magoa pusio Stal, Svenska Vet.-Ak. Handl., 2(7):14.

1867 Magao [?] pusio Walker, Catal. Hemip. Brit. Mus., 1:171.

1876 Amnestus pusio Stal, Svenska Vet.-Ak. Handl., 14(4):21.

1883 Amnestus pusio Signoret, Ann. Soc. Ent. France, (6) 3:373, pl. 15, fig. 199.

1886 Amnestus pusio Uhler, Checklist Hemip. N. Am., p. 3.

1893 Amnestus pusio Lethierry and Severin, Gen. Catal. Hemip., 1:75.

1932 Amnestus pusio Barber and Bruner, Jour. Dept. Agr. Puerto Rico, 16:239.

1939 Amnestus pusio Torre Bueno, Ent. Amer., 19:183.

DIAGNOSIS: The four marginal pegs on the jugum, the small size, 1.2-2.1, and the presence of coarse punctures on the disc of the calli will separate this species and basidentatus from all others in the genus. The females of these two forms are as yet not separable with certainty, but the males of pusio lack spines or angulation on the ventral margin of the anterior tibia and thereby differ markedly from the males of basidentatus which have two prominent teeth on the ventral margin of the anterior tibia (Fig. 132).

DESCRIPTION: MALE:- oval, widest posterior to midlength. HEAD: length about two-thirds width, 0.37 (0.36-0.40): 0.49 (0.47-0.52); interocular width, 0.26 (0.26-0.26); clypeus slightly surpassing juga, latter with four, subequal, marginal pegs; surface coarsely punctate between eyes; antennals, I, 0.09 (0.08-0.10): II, 0.01 (0.01-0.02): III, 0.16 (0.16-0.18): IV, 0.18 (0.17-0.20): V, 0.20 (0.19-0.22); labium attaining posterior coxae, segments, I, 0.14 (0.14-0.16): II, 0.24 (0.23-0.26): III, 0.26 (0.23-0.30): IV, 0.22 (0.21-0.23). PRONOTUM: length almost two-thirds

width, 0.67 (0.65-0.70): 1.03 (1.00-1.06); anterior margin feebly concave; side margins straight or slightly sinuate on basal half; transverse impression prominent, with row of punctures; anterior lobe with large punctures laterally, subapically, medially and scattered over calli; posterior lobe, except umbones, with numerous close-set, coarse punctures. SCUTELLUM: length: width:: 0.43 (0.41-0.46): 0.49 (0.46-0.53). HEMELYTRON: mesocorium with several small scattered punctures discally; exocorium abundantly punctate across full width. PROPLEURON: prosternal carinae about as high as labial II, more or less abruptly terminated posteriorly. LEGS: anterior femur ventrally with premedian spine simple or weakly bifid at apex, postero-ventral margin with minute, subapical tubercle; anterior tibia neither spined nor distinctly angled on ventral margin; posterior femur ventrally with prominent, triangular tooth near apex of antero-ventral margin (Fig. 162). TERMINALIA: gonostylus as illustrated (Fig. 295). LENGTH of body, 1.82 (1.82-1.84).

FEMALE:- similar to male, lacking secondary sexual modifications. HEAD: length: width:: 0.41 (0.38-0.46): 0.54 (0.53-0.57); interocular width, 0.31 (0.30-0.32); antennals, I, 0.09 (0.09-0.10): II, 0.01 (0.01-0.02): III, 0.30 (0.17-0.23): IV, 0.21 (0.20-0.23): V, 0.22 (0.20-0.23); labials, I, 0.15 (0.14-0.16): II, 0.24 (0.23-0.26): III, 0.25 (0.23-0.26): IV, 0.22 (0.20-0.25). PRONOTUM: length: width:: 0.66 (0.63-0.73): 1.09 (1.06-1.16). SCUTELLUM: length: width:: 0.45 (0.44-0.47): 0.54 (0.51-0.56). LENGTH of body, 1.91 (1.82-2.02).

COLOR: yellowish-brown, posterior pronotal lobe and coria usually very slightly lighter, labium and legs pale yellow.

TYPE DATA: Stal's type specimen, a male in the Naturhistoriska

Riksmuseum in Stockholm, Sweden, bears the word "Brasil" as the locality of capture. No locality was given in the original description, but the title of Stal's paper suggested that all included forms had come from "Rio Janeiro." Dr. Rene Malaise generously loaned this specimen to the author for study.

DISTRIBUTION: The specimens studied came from an area extending south from Texas through Central America into South America as far as Colombia and Ecuador and from many of the islands of the West Indies.

DISCUSSION: Although a number of authors reported this species for the southeastern United States, the large series of Amnestus from that region did not yield any specimens. Instead, most of those records appear to belong to the common southeastern species basidentatus which is described as new in the present paper. Another point of interest in relation to the distribution of this species lies in the fact that all specimens, except the type, were found to have come from an area far to the north of the type locality in southern Brazil.

Since the present state of knowledge does not permit certain recognition of the females of this species, only male specimens are reported upon in this paper.

SPECIMENS STUDIED: 137 males. UNITED STATES: Texas: Brownsville; June. MEXICO: Chiapas: Tapachula. Sinaloa: Presidio Riv.; September. Vera Cruz: Tres Zapotes, Pureza; April, June. HONDURUS: Lacertilla, Lombardia, Tela. COSTA RICA: Hamburg Farm; March, April. PANAMA: Ancon (C. Z.), Barro Colorado Is.; January, April, July. COLOMBIA: Colombia. ECUADOR: Cachabi. BAHAMAS: South Bimini Isl.; June. CUBA: Baragua,

Guantanamo, Sto. Tomas; May, June. HAITI: Diquini, Port au Prince; July, August, November. DOMINICAN REPUBLIC: San Francsco. Mts.; January, September. PUERTO RICO: Isabella, Ponce, San Juan; March, August. VIRGIN ISLANDS: St. Croix; May, November. GRENADA: Balthazar. BRAZIL: Brasil (type specimen).

Amnestus radialis NEW SPECIES

DIAGNOSIS: Among those species with five pegs on jugal margins, this species may be recognized by the fuscous line along the radial vein and the four long pegs on the apex of the clypeus.

DESCRIPTION: (based on one male) MALE:- elongate, sides subparallel. HEAD: length about three-fourths width, 0.46: 0.61; interocular width, 0.33; clypeus slightly surpassing apices of juga, latter with five marginal pegs becoming finer toward eye; surface punctate between eyes; antennals, I, 0.12: (II-V missing); labium attaining middle coxae, segments, I, 0.16: II, 0.23: III, 0.23: IV, 0.23. PRONOTUM: length more than two-thirds width, 0.96: 1.38; anterior margin shallowly concave; lateral margins strongly narrowing from base, slightly concave on basal half; transverse impression moderate, marked by regular row of crowded, very coarse, elongate punctures; anterior lobe moderately tumid, with two irregular rows of coarse punctures laterally and subapically, disc of calli and midline with scattered, fine punctures; posterior lobe with numerous punctures, these coarser on apical half; umbones impunctate. SCUTELLUM: length: width:: 0.56: 0.67. HEMELYTRON: apical half of mesocorium mostly impunctate; exocorium abundantly punctate for full width. PROPLEURON: prosternal carinae about as high as labial II, obtusely triangular. LEGS: anterior femur ventrally

with large, unevenly furcate spine near basal third; anterior tibia with low, blunt angulation near middle of ventral margin; posterior femur dorsally with subapical angulation, ventrally with weakly curved, subapical spine about as long as two-thirds femoral height. TERMINALIA: gonostylus as illustrated (Fig. 297). LENGTH of body, 2.47.

TYPE DATA: HOLOTYPE male, "Martinique, W. I., 8-21-29, Bartsch-Hoffmann," in the collection of the United States National Museum.

DISTRIBUTION: A. radialis is known only from the type locality listed above.

DISCUSSION: The following species, described as new on the basis of six distinct pegs on the apex of the clypeus, may be simply the female of radialis. Female specimens that run to the present species should be checked against the next one to determine if they are not the same and to help evaluate the feature of the additional pegs on the clypeus.

Amnestus sexdentatus NEW SPECIES

DIAGNOSIS: The present form, if not based on an abarrent individual, is unique within the genus in possessing six pegs at the apex of the clypeus, the usual four along the margin and one above and one below the margin on the midline (Fig. 60).

DESCRIPTION: (based on one female) FEMALE:- oval, widest behind mid-length. HEAD: length about four-fifths width, 0.47: 0.58; interocular width, 0.32; clypeus slightly surpassing apices of juga, with six pegs apically, usual four along margin and one above and one below margin on midline (Fig. 60); surface with coarse punctures between eyes; antennals, I, 0.12: II, 0.05: III, 0.23: IV, 0.31: V, missing; labium attaining middle

coxae, segments, I, 0.16: II, 0.26: III, 0.23: IV, 0.16. PRONOTUM: length about three-fourths width, 0.83: 1.36; anterior margin shallowly concave; lateral margins strongly narrowing from base, straight on basal half; transverse impression strong only at ends, marked by irregular row of coarse punctures; anterior lobe with two rows of coarse punctures laterally and subapically, calli and space between with few minute punctures; posterior lobe with widely scattered, fine punctures, umbones impunctate. SCUTELLUM: length: width:: 0.56; 0.68. HEMELYTRON: mesocorium with scattered, distinct punctures for full length; exocorium abundantly punctate to costal margin. PROPLEURON: prosternal carinae less than half as high as labial II, rounded. LENGTH of body, 2.24.

COLOR: Head, anterior pronotal lobe and scutellum dark, reddish-brown; posterior pronotal lobe, except immediately mesad of umbones and along narrow posterior margin, yellowed; clavus and corium yellow, former with apical cloud fuscous, corium with subbasal spot, irregular band along radial vein and apical margin fuscous; venter mostly reddish-brown, labium and legs yellow.

TYPE DATA: HOLOTYPE female, "Ponce, P. R., IV-4-1946, L. T., J. Maldonado Capriles," in the collection of the United States National Museum.

DISTRIBUTION: The only known locality in which this form is known to occur is the type locality on the island of Puerto Rico.

DISCUSSION: Whether or not the unusual development of two additional pegs on the apex of the clypeus is abnormal must be proven by examination of additional specimens. If the extra pegs prove to be a freak condition, then this may simply be the female of A. radialis n. sp. to which this

specimen will then run in the key.

Amnestus spinifrons (Say) (Fig. 2)

1825 Cydnus spinifrons Say, Jour. Acad. Nat. Sci. Philadelphia, 4:316.

1851 Amnestus spinifrons Dallas, List Hemip. Brit. Mus., 1:126.

1877 Amnestus spinifrons Uhler, Bull. United States Geol. Geog. Surv. Terr., 3:370.

1867 Amnestus spinifrons Walker, Catal. Hemip. Brit. Mus., 1:167.

1876 Amnestus spinifrons Stal, Svenska Vet.-Ak. Handl., 14(4):21.

1883 Amnestus spinifrons Signoret, Ann. Soc. Ent. France, (6) 3:367, pl. 10, fig. 192.

1886 Amnestus spinifrons Uhler, Checklist Hemip. N. Am., p. 3.

1893 Amnestus spinifrons Lethierry and Severin, Gen. Catal. Hemip., 1:75.

1910 Amnestus spinifrons Banks, Catal. Nearc. Hemip., p. 99.

1917 Amnestus spinifrons Van Duzee, Univ. California Pubs. Ent., 2:23.

1939 Amnestus spinifrons Torre Bueno, Ent. Amer., 19:182.

DIAGNOSIS: Among those species with the five pegs on each jugum, this species may be recognized by the very long labium which surpasses the hind coxae.

DESCRIPTION: MALE:- elongate, sides subparallel. HEAD: length more than three-fourths width, 0.58 (0.53-0.66): 0.73 (0.65-0.78); interocular width, 0.45 (0.42-0.50); clypeus as long as juga, apices continuous; jugum with five marginal spines; surface coarsely punctate on jugum and between eyes; antennals, I, 0.17 (0.14-0.20): II, 0.05 (0.05-0.06): III, 0.33 (0.30-0.36): IV, 0.31 (0.27-0.34): V, 0.30 (0.26-0.33); labium reaching apex of sternite III, segments, I, 0.33 (0.26-0.40): II, 0.51 (0.43-0.56): III, 0.75 (0.66-0.83): IV, 0.42 (0.42-0.48). PRONOTUM: length about two-thirds

width, 1.23 (0.95-1.42): 1.84 (1.55-2.02); anterior margin shallowly emarginate; lateral margins constricted subbasally; transverse impression weaker medially, marked by band of coarse punctures; anterior lobe moderately tumid, coarsely punctate laterally and subapically, finely punctate medially and on calli; posterior lobe with scattered, small punctures becoming finer posteriorly, umbones not punctate. SCUTELLUM: length less than width, 0.81 (0.65-0.91): 0.94 (0.78-1.04). HEMELYTRON: mesocorium abundantly punctate except in postmedian area; exocorium closely punctate for full width. PROPLEURON: prosternal carinae rounded, almost as high as labial II. LEGS: (Figs. 131, 160) anterior femur with strong, bifid spine ventrally on basal third and small simple one near apex on posterior margin; anterior tibia with decided median angulation ventrally; posterior femur with very short, oblique spur subapically on antero-ventral margin. TERMINALIA: gonostylus as illustrated (Fig. 298). LENGTH of body, 3.43 (2.66-3.68).

FEMALE:- similar to male, anterior pronotal lobe not tumid, legs without modifications described. HEAD: length: width:: 0.62 (0.56-0.66): 0.73 (0.66-0.80); interocular width, 0.45 (0.44-0.48); antennals, I, 0.16 (0.15-0.17): II, 0.05 (0.05-0.06): III, 0.31 (0.26-0.36): IV, 0.30 (0.27-0.33): V, 0.29 (0.27-0.33); labials, I, 0.34 (0.33-0.40): II, 0.51 (0.46-0.56): III, 0.74 (0.69-0.83): IV, 0.42 (0.33-0.46). PRONOTUM: length: width:: 1.17 (0.97-1.36): 1.84 (1.62-2.08). SCUTELLUM: length: width:: 0.80 (0.71-0.91): 0.93 (0.87-0.97). LENGTH of body, 3.15 (2.79-3.51).

COLOR: dark reddish-brown; appendages paler.

TYPE DATA: The types of this species, which Say (loc. cit.) described from "Pennsylvania" and "Missouri," are probably lost. Uhler (1878:372),

however, stated that there were specimens in the T. W. Harris collection (now housed in the Museum of Comparative Zoology at Harvard University) which were named "Cydnus spinifrons by Mr. Say." These specimens, as well as specimens of certain other species in the Harris collection, have been considered in a special sense. Since Say's collections have been destroyed, and because these specimens represent some of the little-remaining material studied by Say, workers have generally accepted them as a sort of substitute type for Say's species. The specimens of spinifrons listed by Uhler were reported as "No. 68. Harris Collection, Cambridge, Mass., March 18, 1828, May 15, 1831, Sept. 1831." Obviously, these cannot be the original types because the date of capture of all of them is later than the publication date of the original description.

DISTRIBUTION: From specimens studied, the range of this species appears to extend from Massachusetts south to Florida, thence west to Ontario, Kansas and eastern Texas.

DISCUSSION: Several authors have listed conditions of capture for their specimens, as follows: Van Duzee (1894:169), "Swept from weeds in low, swampy meadow;" Torre Bueno (1915:277), "in beach drift;" Parshley (1923:780), "sometimes found under stones in spring, after hibernation in the adult condition;" Hendrickson (1930:66), "At Andropogon furcatus consocies;" Blatchley (1926:87), "by sweeping herbage or sifting debris in low, moist grounds." Two of the specimens examined bore the field notes, "under drift" and "from soil."

SPECIMENS STUDIED: 51 males, 42 females. CANADA: Ontario: Ridgeway; May. UNITED STATES: Arkansas; Washington Co.; May. District of Columbia: Washington, D. C. Florida: Homestead, Pompana; February. Georgia: Jasper

Co., Peach Co., Upson Co.; February, October. Illinois: Chicago, Homer, N. Ill., Urbana; March to May. Iowa: Ames, Boone, Lake Okoboji; April to June. Kansas: Riley Co.; April. Maryland: Annapolis, Beltsville; May. Massachusetts: Essex, Sherborn; May to July. Missouri: Piedmont; March. North Carolina: Black Mt.; May. New Jersey: Great Notch, Mt. Pleasant, Roselle Park; May. New York: Aqueduct, Bayville, Hamburg, Ithaca, L. I., New York City, Rockaway, Sabael, West Point, Yapahank; April to June, August, October. Ohio: St. Mary's; May. Pennsylvania: Castle Rock; May. Tennessee: Hamilton Co., Roane Co.; February. Texas: Tyler; February.

Amnestus subferrugineus (Westwood)

1835 Cydnus subferrugineus Westwood, Catal. Hemip. Coll. Hope., p. 19.

1868 Amnestus subferrugineus Walker, Catal. Hemip. Brit. Mus., 3:536.

1876 Amnestus subferrugineus Stal, Svenska Vet.-Ak. Handl., 14(4):21.

1883 Amnestus subferrugineus Signoret, Ann. Soc. Ent. France, (6) 3:373, pl. 10, fig. 198.

1893 Amnestus subferrugineus Lethierry and Severin, Gen. Catal. Hemip., 1:75.

1932 Amnestus subferrugineus Barber and Bruner, Jour. Dept. Agr. Puerto Rico, 16:239.

1939 Amnestus subferrugineus Torre Bueno, Ent. Amer., 19:183.

DIAGNOSIS: Among those species with five jugal pegs and length less than 2.5, the present species may be recognized by the vertical anterior edge of the prosternal carinae (Fig. 38) and the immaculate coria.

DESCRIPTION: MALE:- oval, widest behind middle. HEAD: length four-fifths width, 0.45 (0.41-0.51): 0.53 (0.48-0.60); interocular width, 0.32 (0.30-0.34); clypeus slightly surpassing apices of juga; latter with five

marginal pegs becoming smaller toward eye; surface with coarse punctures between eyes; antennals, I, 0.11 (0.10-0.13): II, 0.03 (0.03-0.04): III, 0.27 (0.23-0.30): IV, 0.25 (0.23-0.27): V, 0.30 (0.29-0.31); labium attaining middle of mesosternum, segments, I, 0.16 (0.16-0.18): II, 0.24 (0.21-0.29): III, 0.29 (0.24-0.32): IV, 0.21 (0.20-0.23). PRONOTUM: length two-thirds width, 0.85 (0.66-1.01): 1.23 (1.06-1.37); anterior margin shallowly concave; lateral margins weakly concave at basal fourth; transverse impression strongly impressed, marked by row of slightly coarser punctures; anterior lobe strongly tumid, higher than posterior lobe, virtually impunctate except for two rows laterally and one subapically; posterior lobe, except calli with numerous, close-set punctures. SCUTELLUM: length: width:: 0.51 (0.43-0.56): 0.59 (0.50-0.68). HEMELYTRON: mesocorium with few scattered punctures apically; exocorium closely punctate across full width. PROPLEURON: prosternal carinae higher than labial II, bluntly triangular, anterior margin vertical (Fig. 38). LEGS: anterior femur ventrally with abruptly curved, stout spine near middle, this spine faintly emarginate apically; anterior femur ventrally with decided angulation near middle; posterior femur ventrally with subapical, oblique, straight spine about two-thirds as long as femoral height. TERMINALIA: gonostylus as illustrated (Fig. 299). LENGTH of body, 2.13 (1.82-2.35).

FEMALE:- similar to male but without secondary sexual modifications. HEAD: length: width:: 0.42 (0.40-0.46): 0.53 (0.50-0.56); interocular width, 0.30 (0.28-0.32); antennals, I, 0.11 (0.10-0.13): II, 0.03 (0.02-0.04): III, 0.26 (0.23-0.30): IV, 0.24 (0.23-0.26): V, 0.27 (0.24-0.30); labials, I, 0.16 (0.15-0.17): II, 0.22 (0.21-0.24): III, 0.26 (0.26-0.28): IV, 0.21 (0.20-0.23). PRONOTUM: length: width:: 0.74 (0.63-0.83): 1.18

(1.03-1.30). SCUTELLUM: length: width:: 0.50 (0.40-0.58): 0.55 (0.48-0.62). LENGTH of body, 1.98 (1.69-2.15).

COLOR: Head, pronotum, scutellum and venter reddish-brown; coria yellowish, immaculate; labium and legs yellow.

TYPE DATA: Tye type, which was reported by Westwood (loc. cit.) as having come from "Insula Sti.Vincentii," should be in the collection at Oxford University, Oxford, England.

DISTRIBUTION: Part of the series of specimens studied was from the Island of Grenada, a short distance from the type locality on the Island of St. Vincent, the remainder from Guatemala and Panama in Central America.

DISCUSSION: This is one of the three species labelled as subferrugineus that have passed through the author's hands. Although data on the type were not available, this one fitted the original description better than did the other two and so was tentatively awarded the present name.

Many of the Central American specimens came from "bat caves." Caudell (1924:136) reported more fully on the Panama specimens under the name A. uhleri, as follows: "Numerous in the guano. All but egg stage obtained. This species was collected by Schwarz and Barber 'in cave earth' at Cacao, Trece Aguas, Guatemala, April 3, 1906." These latter specimens were in the series studied.

SPECIMENS STUDIED: 9 males, 11 females, 6 nymphs. GUATEMALA: Cacao, Trece Aguas, Alta V. Paz, Schwarz & Barber Coll., in cave earth, 2m, 6f (USNM). PANAMA: Barro Is., C. Z., Dec. 46 - Feb. 47, J. Zetek, Z-5272, 1m (USNM). Same locality, 20-VIII, N. Banks, 1f (MCZ). Cabima, May 28, '11, August Busck, 1f (USNM). Rio Chilibrillo Bat Caves, Aug. 29, '29, Zetek, Molino & Shannon, 6m, 2f, 6ny (RCF, USNM). Summit, C. Z., XI-1946, N. L. H.

Krauss, 1f (USNM). GRENADA: Grand Etang Rd., (Leeward side), H. H. Smith, 5m, 10f (USNM).

Amnestus uhleri Distant

1880 Amnestus uhleri Distant, Biol. Centr.-Am., Rhynch., 1:453.

DIAGNOSIS: The large size of the body and the greatly elongated clypeus (surpassing apices of juga by more than its own width) strongly mark this species as different from all others in the genus.

DESCRIPTION: (based on one male and two females) MALE: - elongate-oval, widest behind midlength. HEAD: length slightly less than width, 0.93: 0.86; interocular width, 0.52; clypeus surpassing truncated apices of juga by more than its own width; surface irregular, impunctate, shining; jugum with five marginal pegs becoming thicker and longer distally; antennals, I, 0.23: II, 0.06: III, 0.45: IV, 0.40: V, 0.37; bucculae higher than labial II, abruptly terminated posteriorly; labium reaching bases of middle coxae, segments, I, 0.31: II, 0.36: III, 0.40: IV, 0.36. PRONOTUM: length about two-thirds width, 1.71: 2.28; anterior margin shallowly and simply emarginate, anterior angles not cupped; lateral margins entire, straight and subparallel on basal three-fifths; transverse impression moderate, punctate; anterior lobe tumid, impunctate except for single lateral subapical rows of very close-set coarse punctures; posterior lobe, except umbones, with numerous small punctures. SCUTELLUM: width greater than length, 1.10: 0.94. HEMELYTRON: mesocorium with numerous punctures becoming finer and closer apically; exocorium with numerous punctures becoming obsolete toward costa; costa subparallel on basal half. PROPLEURON: prosternal carinae about as high as labial II, evanescent anteriorly, obtusely angled posteriorly.

LEGS: anterior femur ventrally with premedian stout, unequally furcate spine; anterior tibia with ventral margin straight, neither angled nor toothed medially; posterior femur with subapical spine spinose almost rectangularly bent at middle (Fig. 161). TERMINALIA: gonostylus as illustrated (Fig. 300). LENGTH of body, 4.17.

FEMALE:- similar to male, except anterior pronotal lobe with minute but distinct punctures discally in addition to subapical and lateral rows of coarser punctures; anterior femur not armed ventrally; posterior femur ventrally with simple, moderate, oblique spine subapically. HEAD: length: width:: 0.91 (0.90-0.92): 0.98 (0.95-1.02); interocular width, 0.56 (0.52-0.60); antennals, I, 0.22 (0.22-0.23); II, 0.07 (0.07-0.08): III, 0.44 (0.43-0.45): IV, 0.35 (0.35-0.36): V, 0.38 (0.36-0.40); labials, I, 0.33 (0.32-0.35): II, 0.36 (0.36-0.36): III, 0.44 (0.43-0.45): IV, 0.36 (0.34-0.38). PRONOTUM: length: width:: 1.75 (1.62-1.89): 2.41 (2.28-2.55). SCUTELLUM: width: length:: 1.29 (1.20-1.39): 1.06 (0.98-1.14). LENGTH of body, 4.25 (4.04-4.46).

TYPE DATA: The types which are probably in the collection of British Museum of Natural History were listed by Distant (loc. cit.) as coming from "Guatemala, Zapote (Champion); Panama, Volcan de Chiriqui 4000 to 6000 feet (Champion)."

DISTRIBUTION: All specimens studied for this paper had come from Mexico, marking a northward extension of range from the two localities listed with the original description.

DISCUSSION: This "giant" species of Amnestus is strongly marked by the greatly prolonged clypeus as well as the type of armature on the posterior femur of both sexes so should not be confused with any other

known species of the genus.

SPECIMENS STUDIED: 1 male, 2 females. MEXICO: Mexico: Tejupilco, VI-20-33, H. E. Hinton, R. L. Usinger Collectors, 1f (RLU). Vera Cruz: Orizaba, Bilimek, 1883 II, 1m, 1f (Vienna).

Unplaced Species of *Amnestus* Described by Distant in Biologia Central-Americana, Rhynchota 1. (1880)

p. 452 *Amnestus signoreti* n. sp.

Black; lateral and frontal margins of head, lateral margins of pronotum and corium, legs, and antennae pale castaneous. Head with the usual frontal and lateral spines; head, pronotum, scutellum, and corium thickly and coarsely punctate; pronotum with a somewhat obscure transverse incision; membrane pale hyaline, ochraceous at base. Long. $2\frac{1}{2}$ millim.

Hab. GUATEMALA, Quiche Mts. 7000 to 9000 feet (Champion).

The thickly and coarsely punctured upper surface and the pale castaneous lateral margins are the salient features of this species, of which we possess only a single example.

p. 453 *Amnestus dallasi* n.sp.

Black; antennae, eyes, lateral margins of the pronotum, a broad sub-lateral fascia to the corium, and the legs pale castaneous; membrane pale ochraceous and subhyaline, the base and apex very pale castaneous. Head coarsely punctate, with the frontal and marginal spines well developed; pronotum with an obscure transverse incision, the anterior lobe with a few scattered discal punctures, and thickly and coarsely punctate at the lateral

margins, posterior lobe and scutellum thickly and coarsely punctate; corium more finely punctate, the posterior discal and marginal area impunctate. Long. 5 millim.

Hab. MEXICO, Chilpancingo in Guerrero (H. H. Smith).

A single example.

p. 453 Amnestus bergrothi n.sp.

Allied to the preceding species, A. uhleri, but smaller, the anterior lobe of the pronotum more punctate; apical margin of the corium concolorous, the lateral spines of the head much longer and equal in length to those of the frontal lobe. Long. 3 millim.

Hab. MEXICO, near the city and Teapa in Tabasco (H. H. Smith); GUATEMALA, Pantaleon, Duenas, San Geronimo (Champion).

Nine examples.

p. 454 Amnestus stali n. sp.

Head and pronotum castaneous, scutellum black, corium, legs, and antennae ochraceous, apical area of the corium black. Head coarsely punctate, the frontal and lateral spines equally long; pronotum with a distinct transverse impression considerably before the middle, anterior lobe with the anterior and lateral margins thickly and coarsely punctate, and with discal punctures at centre and lateral areas, posterior lobe and scutellum thickly and coarsely punctate; corium more finely punctate, the posterior disk impunctate. Long. 3 millim.

Hab. GUATEMALA, Quiche Mts. 7000 to 9000 feet (Champion).

Allied to the preceding species bergrothi , but structurally distinct by having the pronotum transversely constricted nearer the posterior margin. We have received two examples.

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ACKNOWLEDGMENTS

Before making individual acknowledgments, the author wishes to laud the general spirit of generous cooperation which he has found in nearly every contact that he has made during this study. This wonderful spirit of unselfish aid has transcended lines of nationality and language. It is, indeed, a warming experience to learn that there are areas of human endeavour where mankind can cooperate with mutual respect and understanding.

The author is especially anxious to express his appreciation to those who have made available to him type material or data from the types to which they have access. For the generous loan of type specimens, one of the greatest "helps" that a reviser can receive from anyone, the author is deeply obligated to the following men and the institutions which they represent: Dr. M. Beier, of the Naturhistorisches Museum, Vienna, Austria, for the loan of many of Signoret's types; to Dr. R. Malaise, Entomologiska avedelingen, Naturhistoriska Riksmuseum, Stockholm, Sweden, for loan of Stal's types and one of Signoret's types; to Drs. A. Soos and E. Halaszfy, Musee d'Histoire Naturelle de la Hongrie, Budapest, Hungary, for the loan of certain Horvath types; and to Dr. S. L. Tuxen, Universitetets Zoologiske Museum, Copenhagen, Denmark, for Jensen-Haarup types. Paratypic material of some of Van Duzee's species was made available from the collections of the California Academy of Sciences, San Francisco, California, by Dr. E. S. Ross; and from the United States National Museum, by Dr. R. I. Sailer. For data from the types in institutions whose policy prevents the lending of types, the author is grateful to Dr. W. E. China of the British Museum

of Natural History, London, England, for notes on Dallas and Distant species; to Dr. N. Kormilev, Buenos Aires, Argentina, who made every effort to help with information on the few remaining Berg types in the several Argentine museums; and to Dr. R. I. Sailer, who furnished information on the Uhler types in the collection of the United States National Museum.

More than 12,000 specimens have been made available for study from numerous institutional and private collections, as follows: American Museum of Natural History, New York, New York, by Dr. M. Cazier and Mrs. P. Vaurie; British Museum of Natural History, London, England, by Dr. W. E. China; California Academy of Sciences, San Francisco, California, by Drs. E. S. Ross, H. B. Leech and J. W. Green; Carnegie Museum, Pittsburg, Pennsylvania, by Dr. G. Wallace; Chilean National Museum, by Dr. D. S. Bullock; Direccion General de Agriculture, Mexico City, Mexico, by Dr. F. Bonet; Eastern Illinois State College, Charleston, Illinois, by Dr. G. Riegel; Illinois Natural History Survey, Urbana, Illinois, by Dr. H. H. Ross; Iowa State College, Ames, Iowa, by Drs. H. M. Harris and J. L. Laffoon; Los Angeles County Museum, Los Angeles, California, by Dr. F. Truxal; Michigan Museum Zoology, Ann Arbor, Michigan, by Drs. T. Hubbell and R. F. Hussey; Museum of Comparative Zoology, Cambridge, Massachusetts, by Dr. J. Bequaert; Naturhistorisches Museum, Vienna, by Dr. M. Beier; Oregon State College, Corvallis, Oregon, by Dr. V. D. Roth; San Diego Museum, San Diego, California, by Mr. J. D. Lattin; University of California, Berkeley, California, by Dr. P. D. Hurd, Jr. and Mr. J. D. Lattin, and from the Division of Entomology and Parasitology of the same institution, Davis, California, by Dr. A. T. McClay; University of Kansas, Lawrence, Kansas, by Dr. R. H. Beamer; University of Massachusetts, Amherst, Massachusetts, by Dr. M. E.

Smith; United States National Museum, Washington, D. C., by Drs. R. I. Sailer and H. G. Barber; and Washington State College, Pullman, Washington, by Dr. M. T. James. The following individuals lent their private collections for study: Dr. F. Bonet, Mexico City, Mexico; Dr. D. S. Bullock, Angola, Chile; Dr. J. M. Capriles, Mayaguez, Puerto Rico; Dr. J. C. M. Carvalho, Rio de Janeiro, Brazil; Dr. H. M. Harris, Ames, Iowa; Dr. R. F. Hussey, Gainesville, Florida, Mr. J. D. Lattin, Berkeley, California; Mr. J. C. Lutz, Philadelphia, Pennsylvania; Dr. D. Pelaez, Mexico City, Mexico; Dr. J. A. Slater, Storrs, Connecticut; and Dr. R. L. Usinger, Berkeley, California. To all these individuals and the institutions mentioned, the author wishes to express his sincere appreciation and gratitude.

Real help also came in other forms from certain colleagues on the staff at Iowa State College, the scene of this research. Dr. H. H. Knight, the author's major professor, has been especially generous of his time in discussing many of the problems that have arisen and in giving valued opinions on them; in addition, he has opened his unusually complete and valuable library of older volumes for unrestricted use. For all of this, the author is very sincerely grateful. He also appreciates the help he has received from Drs. H. M. Harris, J. L. Laffoon, J. A. Slater, P. F. Bonhag and J. C. M. Carvalho for various aids, including discussions, opinions, testing of keys and the loan of literature.

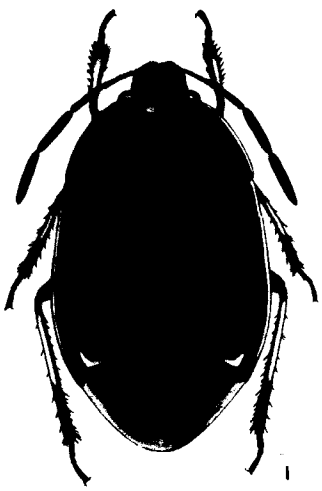
The illustrations are the artistic contributions of the author's wife, Elsie Berbold Froeschner. The first four plates, those of the full figures, were done in a carbon-dust technique with a special chalked surface. Not only for these beautiful illustrations, but also for her

aid in many ways, and her understanding patience during the stress of finally assembling the mass of data that comprises this thesis, the author is sincerely grateful to his wife.

ILLUSTRATIONS

Plate 1. General Habitus, Dorsal View

1. Sehirus cinctus (P. B.)
2. Ammestus spinifrons (Say)
3. Scaptocoris castaneus (Perty)
4. Cydnus aterrimus (Forst.)



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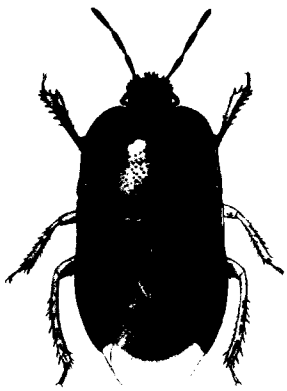

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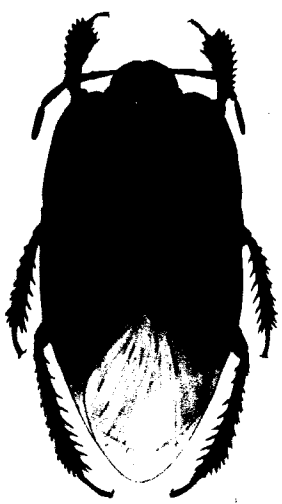

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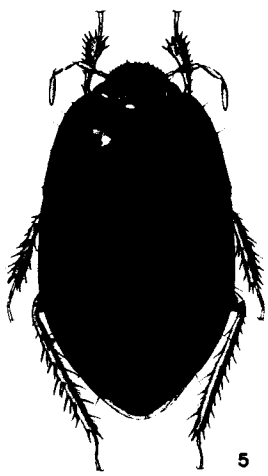
Plate 2. General Habitus, Dorsal View

5. Rhytidoporus indentatus (Uhl.)
6. Tominotus signoreti (M. & R.)
7. Onalips nigerrimus (Dall.)
8. Microporus obliquus (Uhl.)



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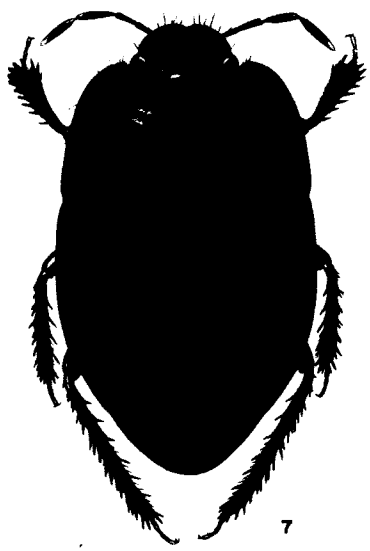

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Plate 3. General Habitus, Dorsal View

9. Macroporus repetitus (Uhl.)
10. Cyrtomenus ciliatus (P. B.)
11. Prolobodes giganteus (Burm.)
12. Homaloporus congruus (Uhl.)

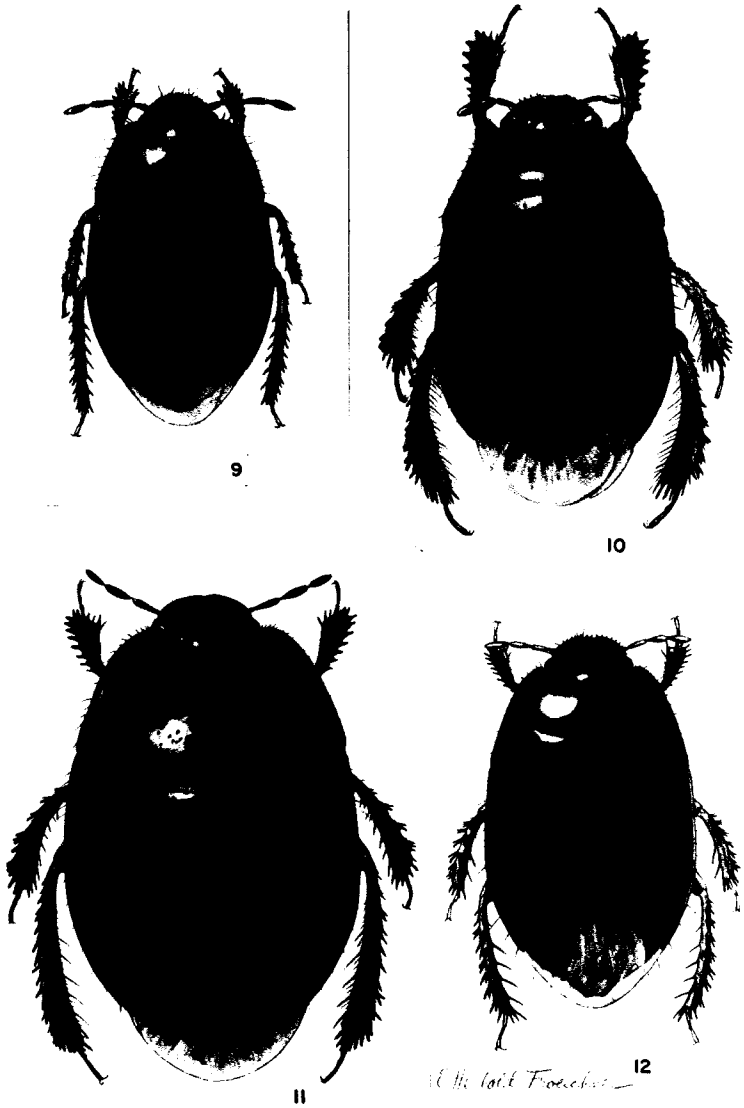
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Plate 4. General Habitus, Dorsal View

13. Melanaethus robustus (Uhl.)

14. Pangaeus serripes (Westw.)

15. Ectinopus holomelas (Burm.)

16. Dallasiellus longulus (Dall.)

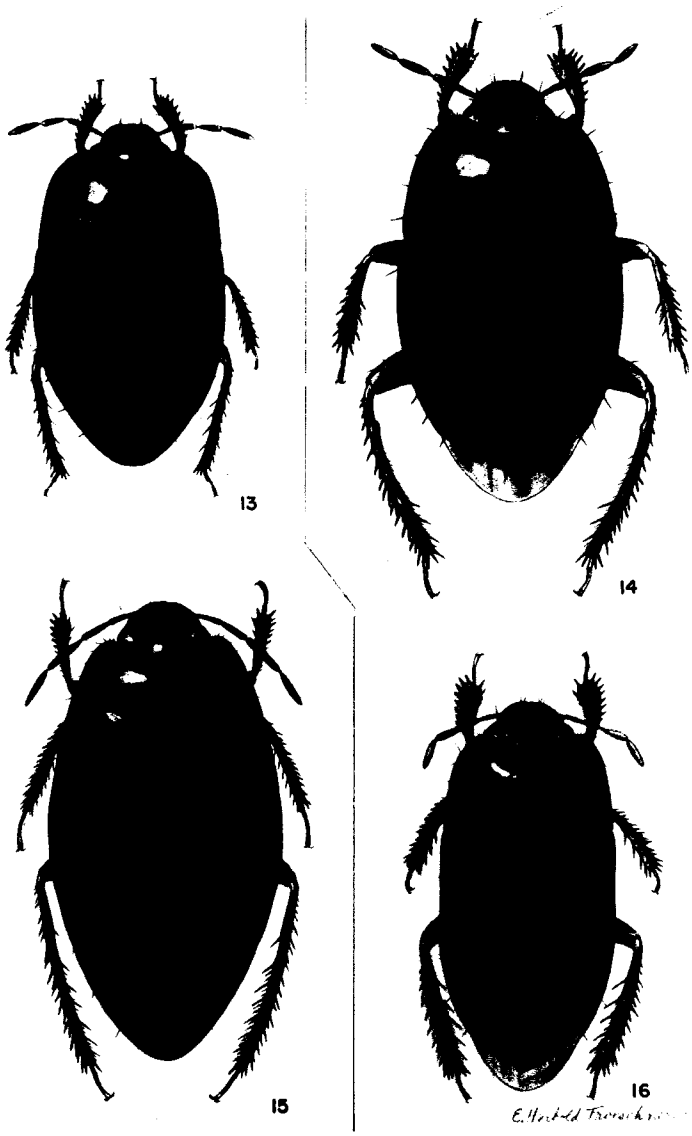
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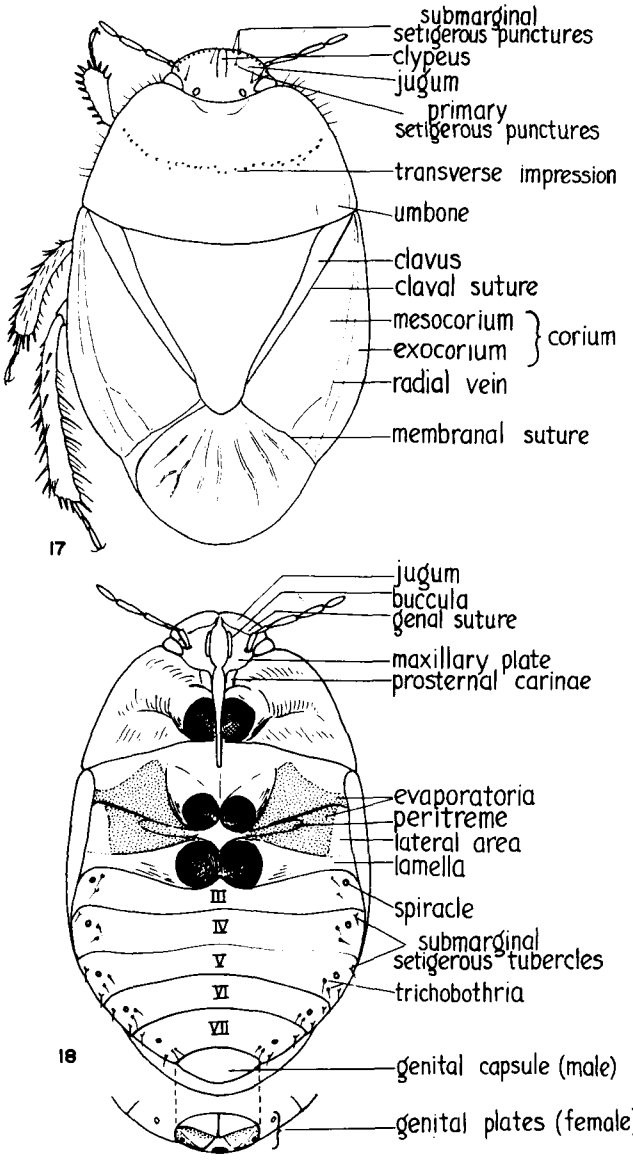
Plate 5. External Features

Used in Keys and Descriptions

17. Prolobodes giganteus, dorsal view

18. Prolobodes giganteus, ventral view of male, with projection showing external genitalia of female.


submarginal setigerous punctures
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jugum
primary setigerous punctures
transverse impression
umbone
clavus
claval suture
mesocorium
exocorium
corium
radial vein
membranal suture
17
jugum
buccula
genal suture
maxillary plate
prosternal carinae
evaporatoria
peritreme
lateral area
lamella
III
IV
V
VI
VII
spiracle
submarginal setigerous tubercles
trichobothria
18
genital capsule (male)
genital plates (female)

Plate 6. Structural Details

Heads - lateral views

19. *Sehirus cinctus* X25
20. *Scaptocoris castaneus* X25
21. *Cydnus aterrimus* X25
22. *Ectinopus holomelas* X40
23. *Melanaethus robustus* X50
24. *Pangaeus serripes* X20
25. *Dallasiellus longulus* X28
26. *Dallasiellus reflexus* X25
27. *Dallasiellus levipennis* X20
28. *Microporus obliquus* X40
29. *Microporus obliquus* X40
30. *Macroporus repetitus* X50
31. *Onalips nigerrimus* X40
32. *Rhytidoporus indentatus* X50
33. *Homaloporus congruus* X40
34. *Cyrtomenus ciliatus* X40
35. *Tominotus signoreti* X40
36. *Prolobodes giganteus* X16
37. *Amnestus spinifrons* X50
38. *Amnestus subferrugineus* X64
39. *Amnestus foveatus* X64
40. *Amnestus championi* X64

Heads - dorsal views

41. *Dallasiellus longulus* X25
42. *Dallasiellus lugubris-reversus* X25
43. *Dallasiellus lugubris-reversus* X25
44. *Dallasiellus bacchinus* X25
45. *Dallasiellus insulens* X25
46. *Pangaeus serripes* X20
47. *Pangaeus punctinotum* X32
48. *Pangaeus rugiceps* X32
49. *Pangaeus setosus* X24
50. *Melanaethus robustus* X40

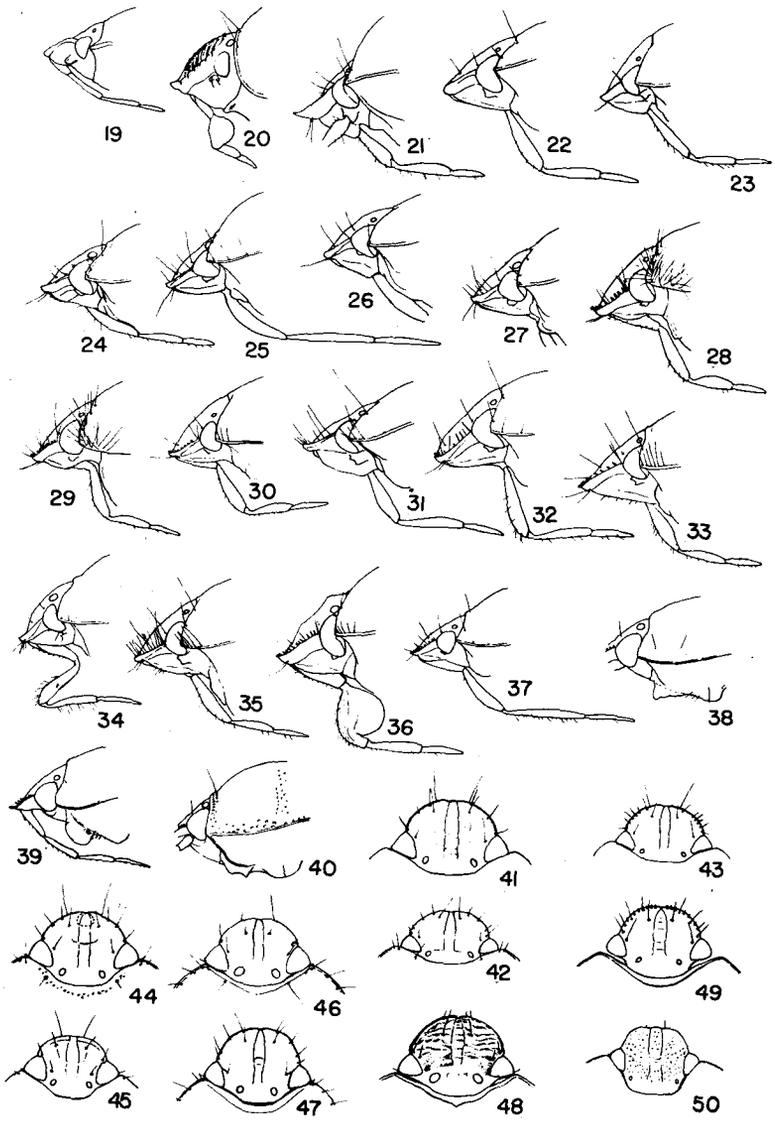
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Plate 7. Structural Details

Heads - lateral views

51. *Scaptocoris castaneus* X25
52. *Rhytidoporus indentatus* X32
53. *Rhytidoporus barberi* X32
54. *Tominotus communis* X24
55. *Tominotus communis* X24
56. *Cyrtomenus ciliatus* X18
57. *Cyrtomenus crassus* X18
58. *Cyrtomenus emarginatus* X16
59. *Amnestus uhleri* X50
60. *Amnestus sexdentatus* X64
61. *Amnestus radialis* X75

Heads and pronota - dorsal views

62. *Dallasiellus megalocephalus* X15
63. *Amnestus pusillus* X50
64. *Amnestus explanatus* X50
65. *Garsauria aradoides* X14

Head, pronotum and scutellum - dorsal view

66. *Ectinopus rugoscutum* X10

Pronota - dorsal views

67. *Melanaethus noctivagus* X32
68. *Tominotus brevis* X20
69. *Tominotus hogenhoferi* X16
70. *Tominotus curvipes* X10
71. *Tominotus curvipes* X10
72. *Tominotus communis* X12
73. *Pangaeus rugonotum* X20
74. *Pangaeus punctinotum* X20
75. *Amnestus lautipennis* X50
76. *Amnestus radialis* X40
77. *Dallasiellus longirostris* X20
78. *Dallasiellus americanus* X16

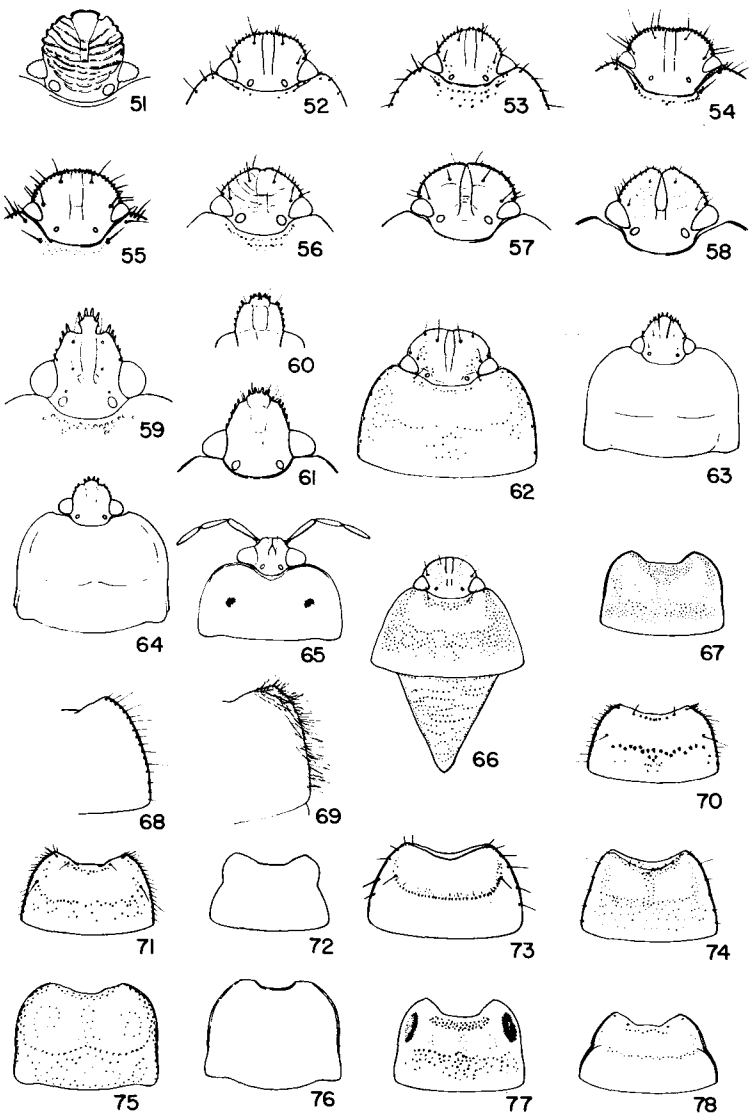
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Plate 8. Structural Details

Scutelli - dorsal views

79. Tominotus communis X16

80. Tominotus constrictus X20

Hemelytra - dorsal views

81. Tominotus blanchardi X20

82. Tominotus impuncticollis X14

83. Pangaeus quinquespinosus X16

84. Amnestus cribratus X32

Meso- and metapleurae - ventral view

85. Scaptocoris castaneus X24

86. Sehirus cinctus X40

87. Sehirus morio X24

88. Garsauria aradoides X32

89. Cydnus aterrimus X24

90a-d. Microporus testudinatus X50

91. Macroporus repetitus X64

92. Rhytidoporus indentatus X50

93. Rhytidoporus compactus X40

94. Rhytidoporus lucida X64

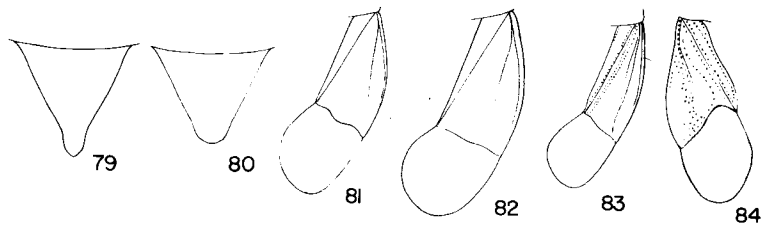
95. Onalips nigerrimus X24

96. Melanaethus robustus X75

97. Melanaethus cavicollis X50

98. Geotomus punctulatus X50

99. Aethus indicus X40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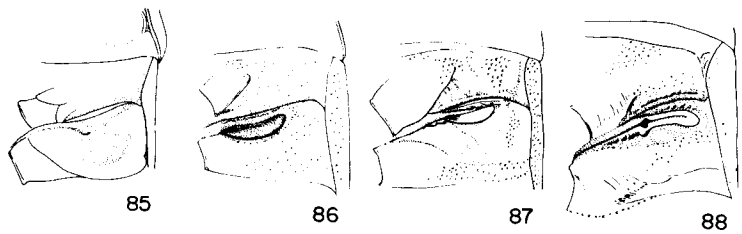
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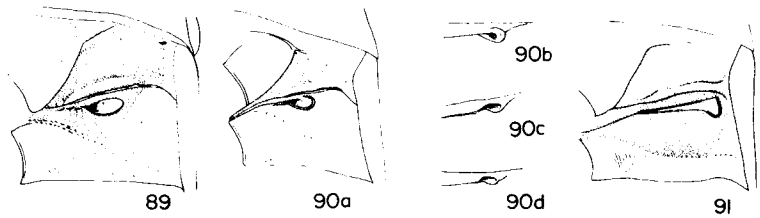
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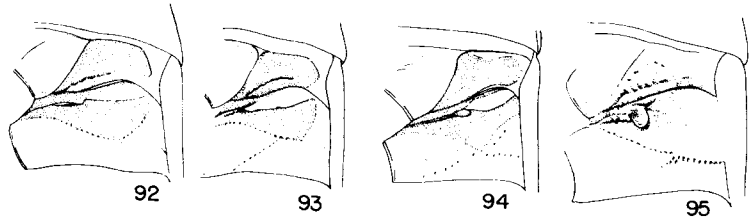
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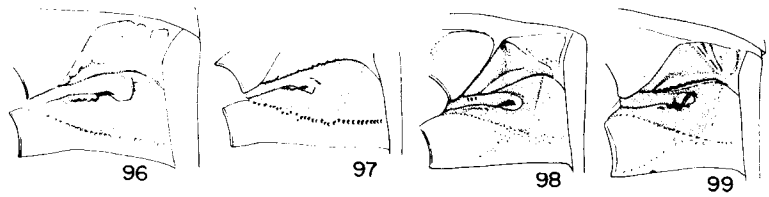
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Plate 9. Structural Details

Meso- and Metapleurae - ventral view

100. Ectinopus holomelas X24

101. Ectinopus opacus X24

102. Homaloporus congruus X50

103. Pangaeus serripes X24

104. Pangaeus bilineatus X24

105. Dallasiellus americanus X40

106. Dallasiellus discrepans X20

107. Dallasiellus longulus X32

108. Dallasiellus interruptus X28

109. Cyrtomenus ciliatus X32

110. Prolobodes giganteus X14

111. Tominotus signoreti X50

112. Pseudonalips cribratus X24

113. Amnestus spinifrons X80

Middle coxa - ventral view

114. Cydnus aterrimus X32

Anterior tibiae - posterior views

115. Scaptocoris castaneus X24

Anterior tibiae - anterior views

116. Cydnus aterrimus X12

117. Tominotus signoreti X50

118. Microporus obliquus X28

119. Onalips nigerrimus X24

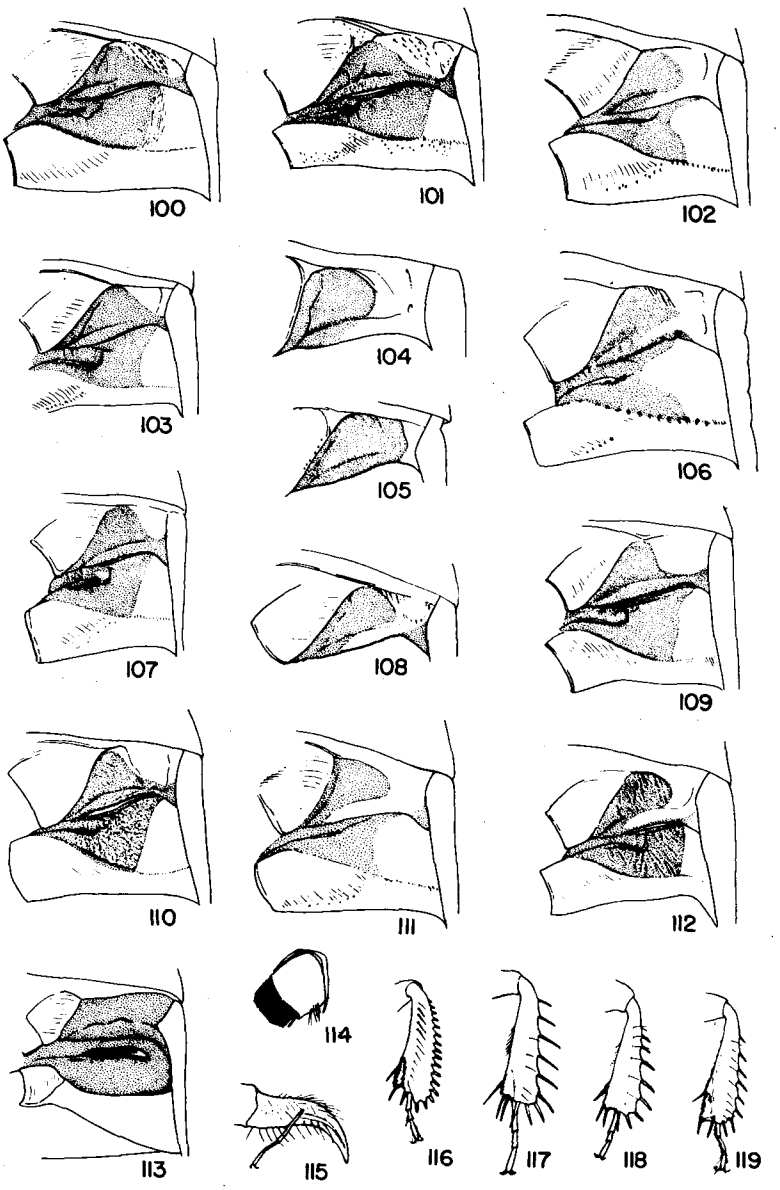
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Plate 10. Structural Details

Anterior tibiae - anterior view

120. *Melanaethus robustus* X64
121. *Macroporus repetitus* X64
122. *Prolobodes giganteus* X16
123. *Cyrtomenus ciliatus* X20
124. *Rhytidoporus indentatus* X64
125. *Homaloporus congruus* X24
126. *Ectinopus holomelas* X20
127. *Pangaeus serripes* X28
128. *Dallasiellus dilatipes* X24
129. *Dallasiellus longulus* X40
130. *Sehirus cinctus* X32
131. *Ammestus spinifrons* X64
132. *Ammestus basidentatus* X75

Middle tibia - posterior view

133. *Scaptocoris castaneus* X24

Posterior tibiae - apical views

134. *Scaptocoris talpa* X16
135. *Scaptocoris terginus* X16

Posterior tibiae - posterior views

136. *Scaptocoris giselleae* X16
137. *Scaptocoris castaneus* X16
138. *Sehirus cinctus* X32
139. *Cydnus aterrimus* X9
140. *Tominotus signoreti* X32
141. *Prolobodes giganteus* X12
142. *Cyrtomenus ciliatus* X20
143. *Macroporus repetitus* X40
144. *Melanaethus robustus* X50
145. *Ectinopus holomelas* X9
146. *Rhytidoporus indentatus* X40
147. *Onalips nigerrimus* X20
148. *Dallasiellus discrepans* X16
149. *Dallasiellus dilatipes* X14
150. *Dallasiellus longulus* X24
151. *Microporus obliquus* X40
152. *Homaloporus congruus* X32
153. *Pangaeus tuberculipes* X20
154. *Pangaeus tuberculipes* X20
155. *Pangaeus serripes* X16

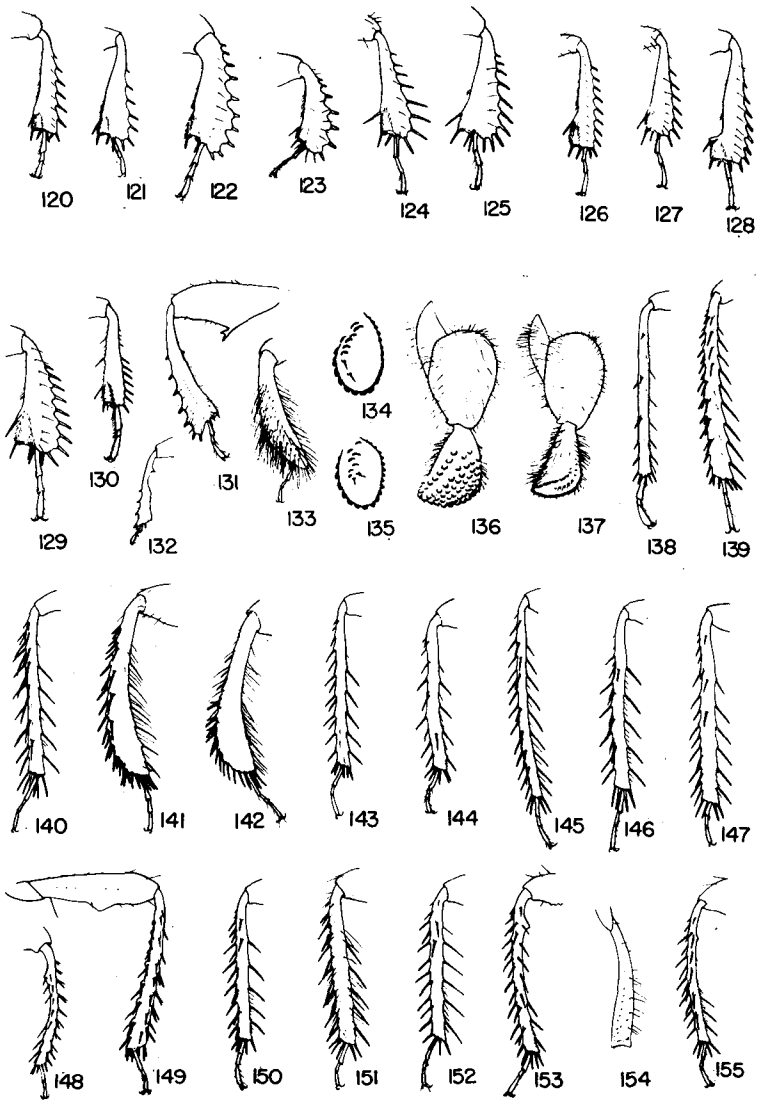
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Plate 11. Structural Details

Posterior legs - posterior view

156. *Pangaeus docilis* X40
157. *Pangaeus piceatus* X32
158. *Pangaeus quinquespinosus* X28
159. *Pangaeus aethiops* X20
160. *Amnestus spinifrons* X64
161. *Amnestus uhleri* X40
162. *Amnestus pusio* X64
163. *Amnestus pusillus* X64
164. *Amnestus pusillus* X64

Mesothoracic wings - anterior parts

165. *Scaptocoris castaneus*
166. *Sehirus morio*
167. *Cydnus aterrimus*
168. *Amnestus spinifrons*
169. *Garsauria aradoides*

Sternites - ventral view

170. *Scaptocoris castaneus*
171. *Sehirus morio*
172. *Cydnus aterrimus*
173. *Amnestus spinifrons*
174. *Garsauria aradoides*

Male terminalia - posterior view

175. *Dallasiellus megalocephalus* X36
176. *Dallasiellus laevis* X48
177. *Pangaeus serripes* X28
178. *Scaptocoris castaneus* X50
179. *Amnestus spinifrons* X50
180. *Onalips bisinuatus* X6
181. *Onalips completus* X6

Female terminalia - posterior views

182. *Ectinopus holomelas* X16
183. *Ectinopus rugoscutum* X20
184. *Amnestus pusillus* X64
185. *Amnestus spinifrons* X50
186. *Cydnus aterrimus* X50
187. *Scaptocoris castaneus* X24

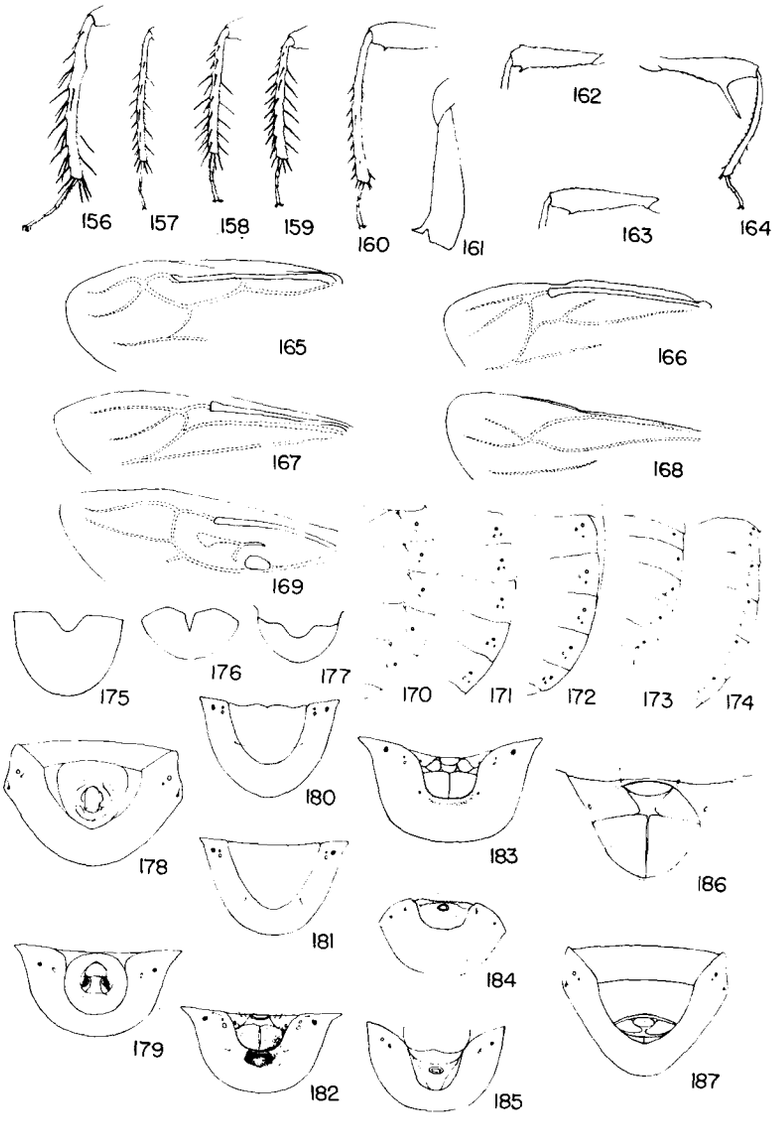
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Plate 12. Structural Details

Dextral gonostyli of males - mesal views

Figs. 188-241 X 45

188. Sehirus cinctus
189. Scaptocoris castaneus
190. Scaptocoris minor
191. Scaptocoris talpa
192. Scaptocoris terginus
193. Rhytidoporus indentatus
194. Rhytidoporus barberi
195. Rhytidoporus compactus
196. Macroporus repetitus
197a-b. Macroporus testudinatus
198a-f. Microporus obliquus
199. Number omitted
200. Cydnus aterrimus
201. Ectinopus holomelas
202. Ectinopus rugoscutum
203. Onalips bisinuatus
204. Onalips completus
205. Onalips nigerrimus
206. Melanaethus aereus
207. Melanaethus anthracinus
208. Melanaethus cavicollis
209. Melanaethus crenatus
210. Melanaethus noctivagus
211. Melanaethus mixtus
212. Melanaethus pennsylvanicus
213. Melanaethus parvulus
214. Melanaethus planifrons
215. Melanaethus robustus
216. Melanaethus spinolai
217. Melanaethus subpunctatus
218. Melanaethus uhleri
219. Homaloporus congruus
220. Pangaeus bilineatus
221. Pangaeus rugiceps
222. Pangaeus setosus
223. Pangaeus tuberculipes
224. Pangaeus aethiops
225. Pangaeus bisetosus
226. Pangaeus docilis
227. Pangaeus impressus
228. Pangaeus laevigatus
229. Pangaeus moestus
230. Pangaeus neogeus
231. Pangaeus piceatus
232. Pangaeus punctinotum
233. Pangaeus quadrisetosus

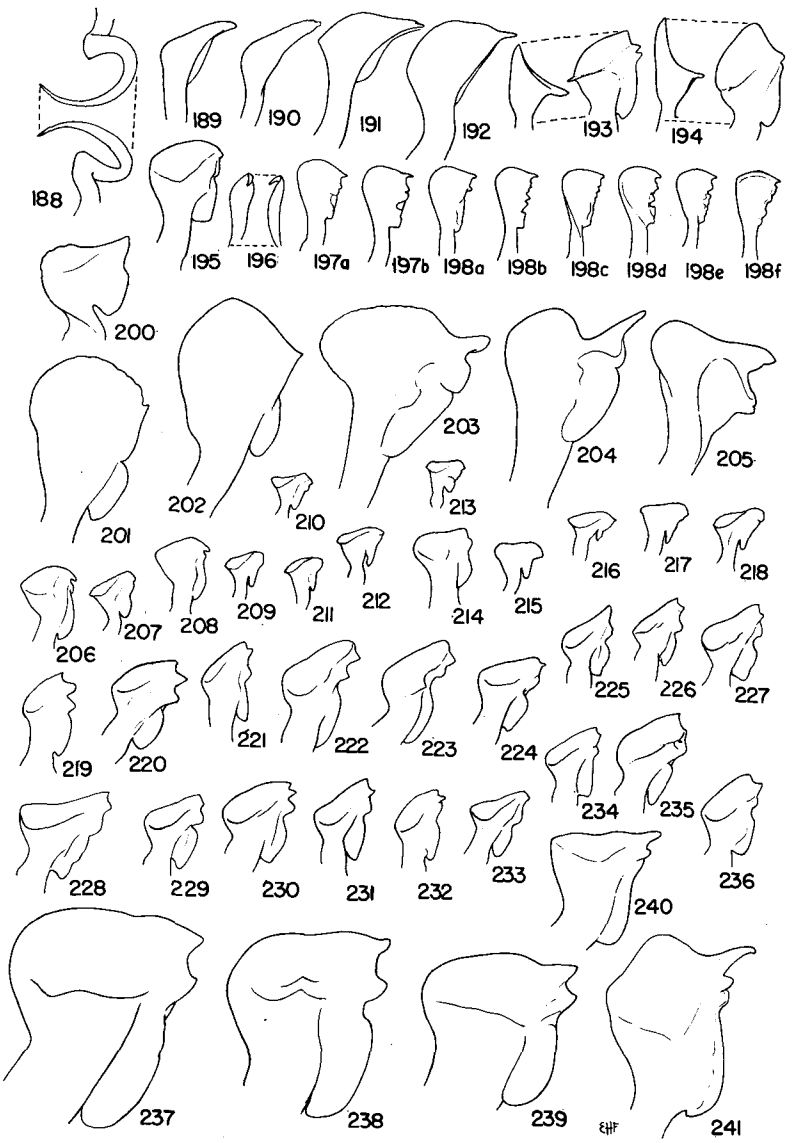
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Plate 12. (Continued)

234. Pangaeus quinquespinosus

235. Pangaeus serripes

236. Pangaeus aethiops

237. Prolobodes giganteus

238. Prolobodes gigas

239. Prolobodes reductum

240. Cyrtomenus emarginatus

241. Cyrtomenus teter

Plate 13. Structural Details

Dextral gonostylis of males - mesal view

Figs. 242-284 X 45 ; Figs. 285-300 X 250

242. *Cyrtomenus grossus*
243. *Cyrtomenus bergi*
244. *Cyrtomenus ciliatus*
245. *Cyrtomenus crassus*
246. *Cyrtomenus mirabilis*
247. *Tominotus brevirostris*
248. *Tominotus brevis*
249. *Tominotus caecus*
250. *Tominotus communis*
251. *Tominotus conformis*
252. *Tominotus curvipes*
253. *Tominotus hogenhoferi*
254. *Tominotus impuncticollis*
255. *Tominotus insularis*
256. *Tominotus signoreti*
257. *Tominotus unisetosus*
258. *Tominotus subtilius*
259. Number omitted
260. *Dallasiellus californicus*
261. *Dallasiellus discrepans*
262. *Dallasiellus puncticoria*
263. *Dallasiellus vanduzeei*
264. *Dallasiellus americanus*
265. *Dallasiellus insulensis*
266. *Dallasiellus laevis*
267. *Dallasiellus longirostris*
268. *Dallasiellus megalocephalus*
269. Number omitted
270. *Dallasiellus alutaceus*
271. *Dallasiellus bergi*
272. *Dallasiellus dilatipes*
273. *Dallasiellus fusus*
274. *Dallasiellus lugubris*
275. *Dallasiellus interruptus*
276. *Dallasiellus longulus*
277. *Dallasiellus murinus*
278. *Dallasiellus orchidiphilus*
279. Number omitted
280. *Dallasiellus planicollis*
281. *Dallasiellus puncticeps*
282. *Dallasiellus solitaria*
283. *Dallasiellus viduus*
284. *Dallasiellus bacchinus*
285. *Amnestus basidentatus*

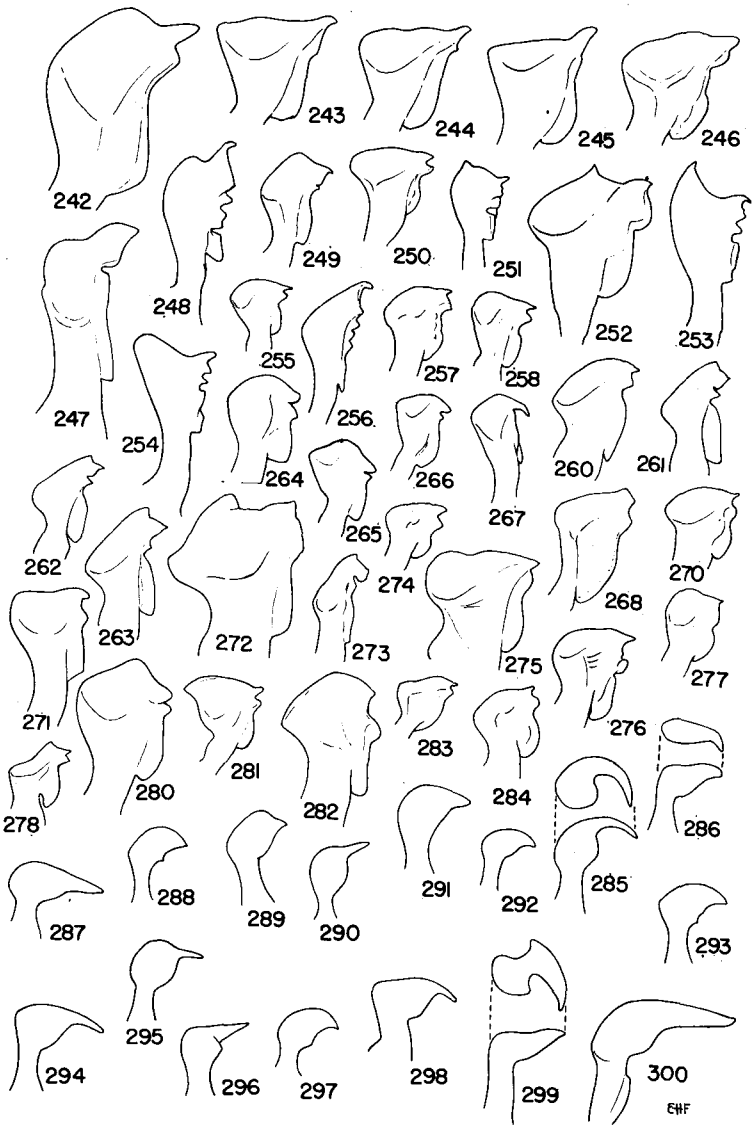
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Plate 13. (Continued)

286. Amnestus bolivari
287. Amnestus brunneus
288. Amnestus championi
289. Amnestus cribratus
290. Amnestus explanatus
291. Amnestus forreri
292. Amnestus lautipennis
293. Amnestus foveatus
294. Amnestus pallidus
295. Amnestus pusillus
296. Amnestus pusio
297. Amnestus radialis
298. Amnestus spinifrons
299. Amnestus subferrugineus
300. Amnestus uhleri

INDEX

Including original and current assignments of each species and generic and subfamily names.